

ANNUAL REPORT

DEPARTMENT
OF
PUBLIC HEALTH

CITY OF NEWARK,
N. J.

—1897—



ANNUAL REPORT

DEPARTMENT OF PUBLIC HEALTH

COMPLIMENTS OF
DAVID D. CHANDLER,
HEALTH OFFICER.

NEWARK, N. J.:
MATTHIAS PLUM, PRINTER,
No. 764 Broad Street.
1898.

BOARD OF HEALTH.

| | | |
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| DR. H. C. H. HEROLD, PRESIDENT, | - | No. 75 Congress Street |
| MR. M. STRAUS, | - - - - | No. 1085 Broad Street |
| MR. A. H. JOHNSON, | - - - - - | 1000 Broad Street |
| MR. J. A. FURMAN, | - - - - | 65 South Tenth Street |
| MR. W. B. GUILD, | - - - - - | 81 Lincoln Park |
| MR. M. T. GAY, | - - - - - | 47 Lincoln Avenue |
| DR. C. M. ZEH, | - - - - - | 481 Broad Street |
| DR. D. L. WALLACE, | - - - - | 192 Clinton Avenue |
| DR. F. W. BECKER, | - - - - | 130 Belmont Avenue |
| DR. W. S. DISBROW, | - - - - | 151 Orchard Street |

HEALTH OFFICER.

| | | |
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| MR. DAVID D. CHANDLER, | - | 74 North Seventh Street |
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STANDING COMMITTEES OF THE BOARD OF HEALTH.

SANITATION.

| | | |
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| DR. W. S. DISBROW, | DR. F. W. BECKER, | DR. C. M. ZEH, |
| MR. A. H. JOHNSON, | MR. J. A. FURMAN, | |

FINANCE.

| | | |
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| DR. F. W. BECKER, | MR. M. STRAUS, | MR. M. T. GAY. |
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APPOINTMENTS.

| | | |
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| MR. A. H. JOHNSON, | MR. J. A. FURMAN, | DR. D. L. WALLACE. |
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LAWS AND ORDINANCES.

| | | |
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| MR. W. B. GUILD, | DR. C. M. ZEH, | MR. J. A. FURMAN. |
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RULES.

| | | |
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| MR. M. T. GAY, | MR. W. B. GUILD, | DR. W. S. DISBROW. |
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SUPPLIES.

| | | |
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| MR. M. STRAUS, | MR. M. T. GAY, | DR. F. W. BECKER. |
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CITY HOSPITAL.

| | | |
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| DR. C. M. ZEH, | MR. J. A. FURMAN, | MR. A. H. JOHNSON, |
| DR. D. L. WALLACE, | MR. M. STRAUS. | |

TRAINING SCHOOL.

| | | |
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| DR. D. L. WALLACE, | DR. W. S. DISBROW, | DR. H. C. H. HEROLD. |
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EMPLOYEES OF THE BOARD OF HEALTH.

OFFICE DIVISION.

| | | | | | |
|------------------------|---|---|---|---|--|
| JOHN J. GREENE, | - | - | - | - | <i>Clerk Bureau of Contagious Diseases</i> No. 147 Warren Street. |
| EUGENE W. BELLAK, | - | - | - | - | <i>Clerk Sanitary Division</i> No. 45 Congress Street. |
| MARIE PERIER, | - | - | - | - | <i>Stenographer to Health Officer</i> No. 372 High Street. |
| EDWARD E. WORL, M. D., | - | - | - | - | <i>Supt. Bureau of Contagious Diseases</i> No. 297 High Street. |
| HERBERT B. BALDWIN, | - | - | - | - | <i>Chemist</i> No. 906 Broad Street. |
| GEORGE C. SONN, | - | - | - | - | <i>Meteorologist</i> No. 285 Belleville Avenue. |

MEAT AND LIVE STOCK DIVISION.

| | | | | | |
|----------------------|---|---|---|---|----------------------|
| WERNER RUNGE, V. S., | - | - | - | - | No. 130 Union Street |
| CHARLES WOLZ, | - | - | - | - | No. 81 Ferry Street |

PLUMBING DIVISION.

| | | | | | |
|---------------------|---|---|---|---|-----------------------|
| JOHN B. SULLIVAN, | - | - | - | - | No. 204 Second Street |
| WILLIAM H. GRIER, | - | - | - | - | No. 37½ Third Street |
| HENRY W. SCHROEDER, | - | - | - | - | No. 187 Bank Street |

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| WILLIAM H. LYLE, | - | - | - | - | <i>Milk Inspector</i> No. 63 Newton Street. |
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INSPECTORS—SANITARY DIVISION.

| | | | | | |
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| THOMAS E. FREEMAN, | - | - | - | - | No. 42 Crawford Street |
| LOUIS H. BRIDGEM, | - | - | - | - | No. 59 Court Street |
| WILLIAM H. YOUNG, | - | - | - | - | No. 179 Thirteenth Avenue |
| ANDREW J. BRADY, | - | - | - | - | No. 115 William Street |
| JOHN WRIGHT, | - | - | - | - | No. 70 Arlington Avenue |
| THOMAS F. NEWTON, | - | - | - | - | No. 32 Clifton Avenue |
| MORRIS SEIDL, | - | - | - | - | No. 411 South Eighth Street |
| FORMAN J. REYNOLDS, | - | - | - | - | No. 182 Summit Street |
| OTTO B. SCHALK, | - | - | - | - | No. 407 Bergen Street |
| CHARLES E. BURKE, | - | - | - | - | No. 202 Thirteenth Avenue |
| ANTONIO PANZERA, | - | - | - | - | No. 66 Madison Street |
| AUSTIN MORAN, | - | - | - | - | No. 97 Wright Street |

DISINFECTING CORPS.

| | | | | | |
|-----------------------------|---|---|---|---|------------------------|
| SAMUEL KNOTT, <i>Chief,</i> | - | - | - | - | No. 279 Plane Street |
| <i>Inspectors.</i> | | | | | |
| JOHN L. BALL, | - | - | - | - | No. 45 Nichols Street |
| WILLIAM PARKER, | - | - | - | - | No. 233 Academy Street |
| HIRAM R. STEWART, | - | - | - | - | No. 66 Thomas Street |

BACTERIOLOGICAL DIVISION.

| | | | | | |
|-----------------------------|---|---|---|---|--|
| RICHARD N. CONNOLLY, M. D., | - | - | - | - | <i>Bacteriologist</i> Laboratory, City Hospital. |
| JOHN C. HOUSTON, M. D., | - | - | - | - | <i>Assistant Bacteriologist</i> Corner Bloomfield and Mt. Prospect Avenues. |
| HERMAN VOLK, | - | - | - | - | <i>Culture Collector</i> No. 108 McWhorter Street. |
| ADOLPH ROLIXMANN, | - | - | - | - | <i>Porter</i> No. 25 South Seventh Street. |

DISPENSARY DIVISION.

| | | | | | |
|-------------------|---|---|---|---|--|
| WILLIAM A. SMITH, | - | - | - | - | <i>Apothecary</i> No. 75 Pennsylvania Avenue. |
| JOHN B. JACOBUS, | - | - | - | - | <i>Assistant Apothecary</i> No. 19 Plum Street. |
| WILLIAM M. GOULD, | - | - | - | - | <i>Dentist</i> No. 89 Halsey Street. |

DISTRICT PHYSICIANS.

| | | | | | | |
|---------------------|---|---|---|---|---|------------------------|
| WILLIAM GAUCH, | - | - | - | - | - | No. 64 Hamburg Place |
| HERBERT W. LONG, | - | - | - | - | - | No. 119 Madison Street |
| WILLIAM M. GOODWIN, | - | - | - | - | - | No. 66 Congress Street |
| OSWALD H. ROTH, | - | - | - | - | - | No. 295 Market Street |
| JAMES A. HOFFMAN, | - | - | - | - | - | No. 126 Spruce Street |
| FRED WEHNER, | - | - | - | - | - | No. 3 Belmont Avenue |
| VINCENT NAGER, | - | - | - | - | - | No. 23 Beacon Street |
| EDWARD STAEBLIN, | - | - | - | - | - | No. 493 High Street |
| THOMAS P. EDWARDS, | - | - | - | - | - | No. 7 Roseville Avenue |
| HUGH M. HART, | - | - | - | - | - | No. 274 Broad Street |
| FRED C. HAGNEY, | - | - | - | - | - | No. 31 Milford Avenue |

MARY SCHAFER, - - - - - *Janitress*
 No. 309 Mulberry Street.

FRANK PETRIDGE, - - - *Orderly at Isolation Hospital*
 Sherman Avenue and Concord Street.

DISTRICT PHYSICIANS, 1897.

- 1st DISTRICT.—DR. W. GAUCH.—District Lines : Polk Street, Lafayette Street, Hamburg Place, Thomas Street and Passaic River.
- 2d DISTRICT.—DR. H. W. LONG.—District Lines : Polk Street, Lafayette Street, Hamburg Place, Thomas Street, Newark Bay, City Line, Avenue "D," Pacific Street, Clifford Street, Jefferson Street and Passaic River.
- 3d DISTRICT.—DR. W. M. GOODWIN.—District Lines : Jefferson Street, Clifford Street, Pacific Street, Tichenor Street, Broad Street, Market Street, Railroad Place and Passaic River.
- 4th DISTRICT.—DR. O. H. ROTH.—District Lines : Railroad Place, Market Street, Lincoln Park, Spruce Street, High Street, Central Avenue, Fulton Street and Passaic River.
- 5th DISTRICT.—DR. J. A. HOFFMAN.—District Lines : High Street, Warren Street, Newark Street, Richmond Street, Rankin Street, Charlton Street, Spruce Street.
- 6th DISTRICT.—DR. F. WEBNER.—District Lines : Charlton Street, Springfield Avenue, Fifteenth Avenue, City Line, Lyons Avenue, Clinton Place, Hawthorne Avenue, Ridgewood Avenue, Livingston Street, Eighteenth Avenue and Spruce Street.
- 7th DISTRICT.—DR. V. NAGER. — District Lines : Fifteenth Avenue, Springfield Avenue, Rankin Street, Richmond Street, Newark Street, Warren Street, Central Avenue and City Line.
- 8th DISTRICT. — DR. E. STAEHLIN. — District Lines : High Street, Eighth Avenue, Clifton Avenue, Norfolk Street, Central Avenue, Hudson Street and Warren Street.
- 9th DISTRICT.—DR. T. P. EDWARDS.—District Lines : Central Avenue, Warren Street, Hudson Street, Central Avenue, Norfolk Street, Clifton Avenue, Bloomfield Avenue and City Line.
- 10th DISTRICT.—DR. H. M. HART.—District Lines : Fulton Street, Central Avenue, High Street, Eighth Avenue, Clifton Avenue, Bloomfield Avenue, City Line and Passaic River.
- 11th DISTRICT.—DR. F. W. HAGNEY.—District Lines : Avenue "D," Pacific Street, Tichenor Street, Lincoln Park, Spruce Street, Eighteenth Avenue, Livingston Street, Ridgewood Avenue and City Line.

ANTITOXIN AND CULTURE STATIONS

Established by the Board of Health for the Collection of
Cultures and Distribution of Antitoxin

| | | | | | |
|-------------------------|---|---|---|---|------------------------------------|
| GEORGE WALLHAUSEN, | - | - | - | - | 110 Union Street |
| FREDERICK W. RODEMANN, | - | - | - | - | 77 Ferry Street |
| GEORGE SCHAEFFER, | - | - | - | - | 28 Bowery Street |
| FRANCIS BRUGUIER, | - | - | - | - | Lafayette Street and Hamburg Place |
| LINNETT BROTHERS, | - | - | - | - | 77 Lincoln Park |
| E. R. PETTY, | - | - | - | - | 925 Broad Street |
| CHARLES HOLZHAUER, | - | - | - | - | Market and Broad Streets |
| HARRY S. JACKSON, | - | - | - | - | 482 Broad Street |
| WILLIAM SCUDDER, | - | - | - | - | 95 Belleville Avenue |
| ALBERT SCHURR, | - | - | - | - | 289 Belleville Avenue |
| JACOB BETZLER, | - | - | - | - | 503 Orange Street |
| FRANK B. MEEKER & Co., | - | - | - | - | 291 Central Avenue |
| JOSEPH GIBIAN, | - | - | - | - | 1 Sussex Avenue |
| DAVID GOLDSTICKER, | - | - | - | - | 51 South Orange Avenue |
| MAX PALIS, | - | - | - | - | 121 Belmont Avenue |
| EMIL REICHEL, | - | - | - | - | 362 Springfield Avenue |
| D. J. EDWARDS, | - | - | - | - | 315 South Orange Avenue |
| OFFICE BOARD OF HEALTH, | - | - | - | - | 843 Broad Street |

ANNUAL REPORT
OF THE
HEALTH OFFICER
FOR THE YEAR 1897.

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HEALTH OFFICER
FOR THE YEAR 1897.

NEWARK, N J , January 1st, 1898.

*To the Honorable, the Board of Health of the City of
Newark, New Jersey:*

GENTLEMEN:—I have the honor to herewith present to you my report of the workings of the various divisions of the Board for the year ending December 31st, 1897.

The past year has been one of active work in this Department of the City Government.

A study of the facts, as presented under the different divisions, together with an analysis of the mortality records, shows that the good effect of sanitation and the enforcement of the ordinances, have had the desired results of not only lowering the death rate of the City, but also in placing Newark foremost in the rank of those cities which have become recognized as progressive in sanitary matters.

The low death rate of 1897—17.43 per thousand, based upon a population of 230,000, as compared with that of 1894—22.25 with a then population of 203,923, is in itself a remarkably good showing.

When it is taken into consideration that Newark is a manufacturing city, and that a large number of its employees are engaged in industries, the nature of which are more or less detrimental to health, and in this respect, even on a par with cities having a much greater population than Newark, the present death rate is far below that of what may be justly expected; and when the causes of diminution are all found in these diseases and deaths, which are in a large measure controllable by the enforcement of Sanitary Laws, there is every reason to feel gratified.

INFECTIOUS DISEASE HOSPITAL AND DISINFECTING STATION

The question of an Infectious Disease Hospital for the care of patients suffering with Scarlet Fever and Diphtheria, as well as a properly equipped Disinfecting Station, has been dwelt upon from time to time by Your Honorable Body. Municipal and Legislative bodies have been appealed to again and again in the cause of suffering humanity, only to meet with rebuff. And, yet, did I not again call your attention to these important factors in the welfare of the city, I should deem myself derelict in my duty as Your Executive Officer, as well as to the community at large.

In order to lessen the number of cases of Scarlet Fever and Diphtheria or any other infectious disease in

a community, two things are primarily essential—isolation and disinfection:

First—The isolation of the patient, *i e*, placing the patient in surroundings which will make it impossible for him to infect others. If this cannot be done at home it becomes the duty of the community to provide suitable accommodations, in the form of an Infectious Disease Hospital. Failure to comply with such accommodations, means the infection of others, for isolation at home can rarely be accomplished, and the deaths which result from these cases are the result of what, from an advanced view, must be looked upon as criminal negligence on the part of the community.

Second—The disinfection. The patient having been isolated it becomes necessary to render harmless all infectious material coming from him. Thorough disinfection is as necessary as isolation.

When a community, through its Board of Health, resolves that patients suffering from Scarlet Fever, Diphtheria, or other infectious diseases, laboring under disadvantages, either from surroundings or lack of means, should have the proper Hospital facilities and comforts equal and very often superior to those which the patient should receive at home, then it is the duty of that community to provide proper Hospital accommodations for those in need of such treatment.

A reference to the report of the Superintendent of the Bureau of Contagious Diseases, giving the number of infectious diseases and the mortality connected therewith, is of itself sufficient cause for this request. "Should a like number be killed through agencies coming under

the control of the Police of a city, the public would be up in arms and thousands of dollars would be willingly appropriated to abate the cause."

"Why not the same public spirit in relation to infectious diseases?" The same logic can also be reasonably advanced in relation to the needs of a Disinfecting Station.

Thorough disinfection can only be accomplished through a properly arranged Disinfecting Station equipped with the latest sterilizing appliances.

In this respect Newark is in the background, while New York, Boston, Philadelphia and other large cities, realizing the necessity of these important adjuncts are fully equipped for the successful combating of these diseases.

Just so long as Newark allows itself to be governed by the old, worn out prejudices which science has thoroughly and practically demonstrated to be unwarranted, just so long will Newark continue not to have an Infectious Disease Hospital and Disinfecting Station suitably located, but a promiscuous scattering of Infectious Disease Hospitals in the houses containing these diseases throughout the city.

GARBAGE DISPOSAL.

During the month of December I called your attention to the matter of "Garbage Disposal" of the city, which is under your advisory control, and which, with the growth of the population, will become a more and more urgent necessity. I would ask the Board to take into consideration at the same time Section 45 of the Sanitary Code, which refers to sunken lots below street grade and

providing for filling the same with ashes, earth or cinders, also providing a penalty for failure.

It is difficult to realize how large a proportion of our growing city is subject to this provision and is now below the legal level, it has been estimated to be almost as much as one twelfth of our area. These filled in portions are destined in the near future to be the seats of factories and the homes of mechanics and artisans of our industrial city.

The constant dumping of mixed refuse and garbage and the necessary decomposition attending the same, has become a fertile source of complaint and a constant annoyance to this office.

In the Summer season, owing to this mixture of refuse, we are compelled to put a stop to all "dumping."

There is one way to strike at the root of this evil and that is the adoption of a different system of collection of house garbage and refuse. That the possibility of this is beyond question has been shown in New York, where to-day it is an accomplished fact, and in other large cities such as Boston, Philadelphia, Brooklyn, etc.

I would therefore recommend an ordinance compelling a "dual system" in the matter of city refuse.

1st. That cinders, clean earth or ashes be placed in a separate box or package and no other substance to be placed therein.

2nd. Liquid garbage, vegetable refuse and all materials liable to fermentation and decay, be placed in a tight receptacle to be separately collected and disposed of in such manner as shall hereafter be provided for by Your Honorable Body.

The enforcement of Section 45, compelling the filling of lots below street grade, entails often unnecessary hardships, where the value of the property is small and the owner is poor and struggling with street assessments and other taxes. Such an arrangement would therefore be desirable, as benefiting both the contractor in disposing of earth, rubbish, and lot owner by bringing up his lot to the street level, at slight expense and without the nuisance of mixed garbage, openly exposed, becoming offensive.

277. The question of liquid garbage and animal and vegetable refuse is a far more serious problem to deal with. Inquiries have been made as to the methods employed in other municipalities in order to obtain the best results.

A crematory to burn and render it innocuous is a possibility and is employed in various cities. I would recommend for your consideration, as to cost and advisability, two plans:

1st. Cremation.

2nd. Reduction.

From statistics obtainable at present (Journal Am. Public Health Assoc.—1906) garbage analyzed shows the following percentages:

Water or moisture 60% to 80%

Rubbish (bottles, cans, rags, etc.) 7%

Animal and vegetable dry matter 20%

Grease 2% to 4%

The residues from the cremation of garbage constitute about 10% of the original mass. These percentages may be subject to a little variation, in account of the varying condition of the moisture of any particular climate and the

ingredients of the various districts of the same city may vary to a considerable degree—"factory waste" being an important factor

1st. Cremation. This insures absolute destruction of all waste products, and from a purely sanitary point of view would seem an ideal method. The net result is 5% of the mass in the shape of ashes containing potash, and these have some salable value, say 27 cts per ton.

It may destroy germ life (Bacteria, etc) but there is some escape of gases, especially on damp days and is said to be open to the charge of spreading a shower of fine ashes. The cost of labor, fuel and apparatus should also be estimated (\$1.01 per ton?)

2nd. Reduction This is a system of partial destruction with an idea to render innocuous, and also available, the "waste products."

Its products, mainly, are two in number.

1st. Grease, which is utilized either as a lubricant or for soap stock.

2nd. A filler for high grade fertilizers

Only one system can have a practical bearing—that which receives the garbage from the wagon into a steam tight receiver or digester, and in this the garbage, gases and effluent matters remain continuously and are not exposed to the air at any time, until it is dried, condensed or evaporated and are no longer unsanitary or offensive and the "effluent" is without color and nearly odorless; there should be but one handling of the garbage, all the apparatus should be under seal and vacuum, no odors should be apparent and all gases generated, by heat or treatment, are to be dissipated by water or burned under

the boilers, the effluent to be discharged under sanitary safe-guards.

The matter of "Garbage Disposal" should be under municipal control and the Health Board should be the one in charge. City filth means city disease. If city life favors the spread of germ diseases, we must raise the standard of protection in this regard to the level of advances in other cities, where the problem has come up for consideration.

I would suggest a thorough discussion and investigation of the entire subject before any process is adopted.

SMOKE.

I desire to call your attention to the constantly increasing volumes of smoke emanating from the different manufacturing plants located throughout the city. While Newark, as a manufacturing centre, has been more than fortunate in this respect, yet the tendency on the part of manufacturers in the adoption of soft or bituminous coal as a fuel is fast becoming a source of repeated complaints on the part of our citizens. This is a growing evil and will, if allowed to continue without some action being taken towards regulating the same, prove a very difficult problem to solve in the near future.

The following article, taken from a former report of the supervising Engineer of Cincinnati, Ohio, gives some very interesting and decidedly educational facts relative to combustion:

COMBUSTION.

"Bituminous coal is composed of carbon, hydrogen, oxygen, nitrogen and ash, the larger part being carbon

When the temperature of carbon and hydrogen is raised to a high point they combine with oxygen, and the result of the union is heat. Since the larger part of fuel is composed of carbon, and contains very little oxygen, it must receive from the atmosphere the necessary amount of oxygen to produce fire. In all combustion, then, care must be taken to admit sufficient air to the furnace to provide the required quantity of oxygen, or graduate the supply of fuel in keeping with the quantity of air naturally in the fire-box. If one or the other is not done, the result is imperfect combustion; that is to say, all the elements of carbon and hydrogen can not combine and burn, because there is not air (oxygen) enough within the furnace to make the complete union possible. This is what causes smoke. Smoke consists of watery vapor, in large part carrying in it particles of unconsumed dark colored carbon. Therefore

a Smoke results solely from imperfect combustion.

b When combustion is thorough smoke is impossible.

c Combustion will be thorough and perfect only when the chemically correct quantity of oxygen (air) is supplied to chemically unit with all the atoms of carbon and hydrogen. If an insufficient amount of oxygen (air) is supplied to the furnace, all of the atoms will not be consumed.

d No furnace can give air (oxygen) enough to produce this complete combustion through its grate bars.

e The combustion in an ordinary steam-boiler furnace is imperfect because it receives air through the grate-bars only. All smoke devices are an attempt to augment the quantity of air delivered to the fire and there can be

no success in decreasing smoke in ordinary furnaces unless this is the principle of the device used.

f. Since sufficient air (oxygen) to produce perfect combustion can not be obtained through the grate-bars alone, then it must be introduced to the fire-place at the front or sides of the furnace, or at the bridge-wall, and brought in contact with the burning gases.

There are six types of smoke device—smokeless fuels, electricity, freight furnaces, mechanical stokers, steam jets, and careful firemen.

There are a hundred and one smoke consuming devices in the market many of which are excellent, while others are worthless. This being the case, great care should be taken on the part of the manufacturer in not only selecting that which *seems* to prove the best, but also that which shall prove to be the most economical in the end.

STEAM JETS

The steam-jet is the most common device used to produce smokeless fires. They have been reported on a hundred different occasions to have been sold under a hundred different names.

The object of the steam injector is to do one or both of two things:

1st. To augment combustion by supplying a quantity of air over the fire.

2nd. To violently agitate the air in the fire-place, so as to bring more particles of oxygen in contact with the burning gases.

Many of the best steam jets are miserable make shifts

No steam-jets should be attached to a furnace unless they are equipped with an automatic turn on, and an automatic cut off. If this is not the case, negligence on the part of those in charge, very often, causes them to forget that such a thing as steam injectors exists. If these steam jets were made automatic so that the door of the furnace could not be opened to fire unless the jets were turned on, that would insure their use, and an automatic cut off so arranged as to stop the flow of steam in from four to six minutes, would prevent any unnecessary waste of steam or of fuel.

In placing this matter before you I have done so fully realizing the difficulties which will present themselves to you for your consideration.

In New York, Chicago, St. Louis, Cincinnati, Cleveland, Pittsburg and other manufacturing centres, laws and ordinances governing the same are enforced and practically applied.

The passing of an ordinance at this time would seem to be unnecessarily harsh. I would, therefore, suggest cooperation and cooperation on the part of the manufacturers and the engineer and firemen in their employ.

I am satisfied that the men employed as engineers or firemen throughout the city, are as competent a class of men as those of any other large city, and that they perform their work as conscientiously as men do in ordinary vocations.

But this is not enough; when manufacturers, engineers and firemen realize that they must have a greater sense of right and wrong than is ordinarily exercised in the affairs of life, when they feel that they would like to

do unto others, as they would desire others to do unto them, they will adopt means which will prevent the throwing of smoke all over their neighbors' property, because they would not care to have the same thing done unto them.

With this feeling prompting the employer, he will consult with the employee and try to get the best smoke consuming device he can to prevent the annoyance.

An engineer or fireman who has no higher motive in preventing smoke than to keep the authorities from catching him, rarely does any good either in the selection or the use of a smoke device.

Therefore, it seems to me that much depends not only on the part of the manufacturer in selecting the proper device, but largely upon the part of the employee in charge as well.

CITY WATER SUPPLY

This subject is perhaps more important than any other with which we have to deal. Fortunately Newark has no supply which is naturally of high purity is probably unequaled by any other supply of equal capacity in the country.

The character of the watershed, too, is in the main superior to that of any other large watersheds.

Nevertheless in a drainage area of over sixty-two square miles, there are necessarily many possible sources of pollution, which are a more or less serious menace to the health of the city. During a recent inspection of the watershed, many of these places were located, and the attention of the East Jersey Water Company called to

them. Since then, many of these sources of pollution have been removed and the owners, or representatives of owners, have been interviewed, and all, with the exception of two, have expressed a willingness to remove any source of pollution found on their individual premises.

A further inspection of these places is now being made, and all persons then found not to have abated existing sources of pollution, will be served with legal notices by the proper authorities, allowing two weeks for the abatement of same. If these notices are not complied with, complaints will be made and the owner or representative of owners will be proceeded against according to law.

Monthly examinations of the water have been made by the Bacteriologist and Chemist of this Board, showing very satisfactory results. The determinations are very uniform, none of them differing materially from the average for the year. (See tables in Bacteriologist's and Chemist's reports.)

To anyone familiar with the analysis of water, this of itself should be sufficient evidence of the purity of our water supply. And such is the case, both from a manufacturing and sanitary standpoint.

PUBLIC ABATTOIR.

In my report of 1896 mention was made of the benefit to be derived from the establishment of a Public Abattoir under the control and supervision of the Board of Health.

With a Public Abattoir located at a point convenient to the intercepting sewer and having proper railroad facilities, with tracks running to same, would of itself not

only prove a source of benefit to the dealers and butchers from a financial standpoint, but would prove a benefit, from a sanitary view, to the community at large.

With an Abattoir thus situated not only would the practice of driving or carting large drives of cattle and live stock through the public thoroughfares of our city cease to prevail (that is not only unsightly but detrimental to the cleanliness of our streets as well) but the business coming under the absolute control of the Department would not only insure practical sanitary measures, but would also insure a thorough ante-mortem as well as a post-mortem inspection of all stock killed.

I believe such an institution with the necessary ordinances governing the same would meet with all the requirements pertaining to slaughter houses and the sale of meats, and could be regulated in such a manner as to be self sustaining.

SUITABLE QUARTERS, INCLUDING AN EMERGENCY HOSPITAL AND AMBULANCE SERVICE

The necessity of securing a suitable building, centrally located, wherein the different divisions of the Department could be accommodated, grows more and more apparent as the needs of the Department become apparent. With the main offices of the Board located at No. 843 Broad St.; the Dispensary, with its various clinics, occupying rooms in the Centre Market building, the members of the Board crowded to such an extent as to be almost suffocating, and totally inadequate in every way to meet the requirements for which they

were intended, with the Disinfecting Corps located in the same building, the Chemist in rooms at 906 Broad St. and the Bacteriologist of the Board and the Laboratory at the City Hospital building, the advantages of the department for concentrated work is, to say the least, somewhat limited.

The question of an Emergency Hospital and Ambulance Service, adequate to the requirements of this rapidly growing city, is in nowise a new idea to the members of the Board. I believe the time is now propitious for this Board to take the necessary action towards securing these requisite adjuncts.

With a building of this character thus located with the various Divisions of the Department, including an Emergency Hospital and Ambulance Service, open day and night, whereby all cases, Hospital or otherwise, in need of medical attention could be taken for prompt relief and distribution, I believe that the Board of Health would indeed be in a position to successfully combat the difficulties it has now to contend with.

At a meeting of the Board of Health held on February 2d, 1897, a Special Committee, consisting of Dr. D. L. Wallace, Mr. J. A. Furman and Mr. A. H. Johnson, was appointed by Your Honorable Body to secure suitable quarters for the express purpose of covering every requirement mentioned above, taking into account the amount of room necessary, as well as the peculiar wants of the several divisions of the Department. Your Committee, after a search of several weeks, occupying much time, absolutely failed to find a building that would come anywhere near their requirements, and which could be

secured with the limited appropriation at the command of the Board, thus making it utterly useless to proceed further. While the Police, Fire, Street and Water and Educational Boards of the city are amply provided with buildings and appropriations adequate to their wants, and lastly so, it does seem to me that this Department, so often brought face to face with matters pertaining to life and death, should receive, at least, the same liberal support and encouragement.

VITAL STATISTICS.

BIRTHS.

The total number of births reported during the year was 5,420. Of this number 5,330 were white and 90 colored; 2,758 were male and 2,664 were female, and the sex of one was not stated. 3,341 were legitimate and 169 were illegitimate.

The birth rate per thousand of the population is 23.56, and exceeds the death rate for the year 6.13.

There were 313 still births, or 1.36 per thousand of the population. (See table I.)

MARRIAGES.

There were recorded 2,229 marriages. This represents 11.05 per thousand, which must be considered as a low rate. No fault on the part of those whose duty it is to report these facts, is the cause. (See table II.)

DEATHS.

There were reported during the year 4,010 deaths, which represents a death rate of 17.43 per thousand of the population. Of these 2,735 were native born and 1,263

foreign born, and in 35 cases the nativity was not stated (See table III.)

The social state of decedents was as follows :

| | |
|------------|-------|
| Married | 2,249 |
| Single | 1,143 |
| Widow | 34 |
| Widower | 218 |
| Not stated | 65 |
| Total | 4,010 |

Six-hundred and sixty-one deaths occurred in institutions. (See table IV.)

The fact that the Board of Health has access to the births, marriages and death returns is owing to the courtesy of the City Clerk, the latter being the Registrar of Vital Statistics. This necessitates a double entry of all deaths, one in the office of the Board of Health for statistical purposes; the other in the books of the City Clerk as a matter of record. The Vital Statistics properly belong to the Board of Health and can never be absolutely correct, until so placed, as the medical knowledge at command of Boards of Health is indispensable to the proper classification and recording of vital facts. Another important reason is that it would bring the Board of Health in direct contact with, and give it control over the undertakers in the city. This is of vital importance in the disposition and burial of those who die from infectious diseases.

I would recommend that special attention be given this matter by Your Honorable Body, and that action be taken whereby a suitable law may be enacted, which will make the Board of Health the Registrar of Vital Statistics.

The following is a detailed report of the workings of

| | |
|---------------------------------|-------|
| N. of verbal notices given..... | 2,481 |
| " " abatements from same | 1,881 |
| " " hours in court..... | 22 |

$$dH = \gamma dL = D_{\perp} \frac{1}{\rho} d\rho \quad (1)$$

| | |
|----------------------------------|-------|
| Wells inspected | 124 |
| Sanitary connections inspected | 23 |
| Drains inspected | 518 |
| Cesspools inspected | 1,229 |
| Alleys inspected | 421 |
| " filthy | 516 |
| " need repairing | 75 |
| Streets need cleaning | 12 |
| Areas dirty | 163 |
| Cellars dirty | 242 |
| Ashes accumulation | 524 |
| Garbage accumulation | 318 |
| Drainage surface | 310 |
| Lots filthy | 73 |
| Lots stagnant water | 10 |
| Manure accumulation | 71 |
| Defective water pipes | 354 |
| Houses filthy | 112 |
| " unfit for habitation | 37 |
| Slaughter houses inspected | 0 |
| Houses unprovided P. V. or W. C. | 23 |
| " no water supply | 8 |
| Roofs defective | 51 |
| Hydrants defective | 34 |
| Privy houses filthy | 84 |
| Privies foul | 1 |
| Cesspools full | 111 |
| Privy houses dilapidated | 204 |
| P. Vs. ordered reconstructed | 25 |
| P. Vs. ordered rebuilt | 5 |
| Yards inspected | 1,058 |
| " filthy | 1,451 |
| Plumbing defective | 1,118 |
| Water closets defective | 731 |
| Stables inspected | 513 |
| Reinspections | 12 |

| | |
|---|------|
| Total No of nuisances found, | 5158 |
| House to house inspections | 533 |
| Permits granted to clean privy vaults and cesspools | 1300 |
| Privy vaults cleaned..... | 1277 |
| Cesspools cleaned | 21 |

PLUMBING DIVISION.

This division is under the supervision of three practical Plumbers, and the work of these Inspectors is creditably performed. The uniform system of filing plans, as adopted by the Board, and the index by streets and the filing system, are so arranged that in future years the plumbing plan of any house, together with the specifications, can be found at once, no matter when the plan was filed. These plans will be of considerable value in years to come as they show the location of all pipes and fixtures.

The following is a summary of the work performed by this division :

| | | | |
|-----------------------------|----------------------|------|-------|
| Plans approved | { New buildings..... | 795 | |
| | { Old buildings.. | 410 | |
| Total..... | | | 1,205 |
| Plans rejected..... | | | 150 |
| Permits for McClellan Vents | | | 30 |
| Hours in court..... | | | 25 |
| Peppermint tests | { Passed.... | 125 | |
| | { Not passed | 72 | |
| Total.. | | | 197 |
| Water tests made | { Passed.... | 2215 | |
| | { Not passed. | 153 | |
| Total | | | 2,368 |
| Plumbing inspections | { New buildings | 544 | |
| | { Old buildings. | 76 | |
| Total | | | 1,013 |

[illegible]

MEAT AND LIVE STOCK DIVISION

This division is under the supervision of two Inspectors, one of whom takes charge of the slaughter houses and the other of the meat shops, and the other an expert in the preservation of the public and private food and vegetable canners. A summary of the work of this division for the year, including the contributions, is as follows:

SLAUGHTER HOUSE AND LIVE STOCK INSPECTIONS
WERNER RUNGE, INSPECTOR

| | |
|--------|--------|
| Cattle | 11,672 |
| Cows | 18,840 |
| Sheep | 22,673 |
| Hogs | 5,893 |
| Total | 59,078 |

CONFIDENTIAL

| | |
|--------|-----|
| Peas | 1.1 |
| Culves | 1.4 |
| Cattle | 1.5 |

INSPECTION OF BUTCHER SHOPS AND CONDEMNATION

| | |
|--|---------|
| Butcher shops visited | 10,312 |
| No. of carcasses of beef inspected | 30,020 |
| No. of lambs and sheep inspected | 104,037 |

| | |
|--|---------|
| No. of calves inspected . | 13,471 |
| No. of swine inspected | 16,076 |
| Total No. of carcasses inspected. | 163,594 |

| CONDEMNED | | VEGETABLES. | |
|--------------------------|----------|-------------------------------|--|
| Bob calves. | 30 | 3 bbls. of peas. | |
| Hind quarters of beef... | 9 | 3 bbls. of potatoes. | |
| Smoked beef | 1 side | 1 box of eggs | |
| Pork | 20 lbs. | 13 complaints attended to and | |
| Lard | 12 lbs. | same adjusted. | |
| Veal | 5 lbs. | Centre Market visited daily | |
| Pork | 22 lbs. | | |
| Poultry | 160 lbs. | | |

FRUIT.

| | |
|--------------------------|------------------------|
| 424 qts. of strawberries | 5 baskets of cherries. |
| | 1 box of peaches. |

Of the sixteen cases of Glanders reported to the Board, eleven were found to be suffering from the disease and ordered killed. The post mortem made in these cases verified the diagnosis.

Of the five suspicious cases reported, one was found suffering from swelling of submaxillary glands on left side of leg and dark red fish injection of the mucous membrane of the nostrils. Advised by continuing the animal and on re-examination five days later symptoms had disappeared and the animal was improving.

A second case of suspected Glanders reported, proved to be a case of Bronchial troubles.

A third case reported, was investigated; mallein test ordered; results negative.

A fourth case reported, was treated in a similar manner with the same results.

The fifth case proved itself to be a case of Chronic Bronchial Catarrh.

It is the custom in all cases of Glanders, where there is any doubt as to diagnosis, to give the mallein test applied, but where the case is clear to a competent Veterinarian, the animal is destroyed without further delay.

In all cases animals that have been exposed, are examined and kept under surveillance for several days, premises are always thoroughly disinfected and in many instances mangers, floors and side partitions of infected stalls have been removed and replaced with entirely new material.

The year, taken throughout, has been one in which the contagious diseases of animals have caused less loss than usual. This is due to a better knowledge on the part of owners of the necessity of at once notifying the proper authorities, as to the existence of the disease and a willingness to co-operate in every way in limiting its spread.

MILK INSPECTOR'S REPORT

The report of the milk inspection as given below, together with the number of cow-stables inspected and animal permits granted, shows conscientious labor and duty performed by this Inspector.

A thorough inspection of the cow-stables has been made, and where possible the sanitary condition of the same has been corrected.

In other cases permits to keep cows have been refused, either owing to the surroundings or the inability to correct the sanitary condition existing. In all these

cases the owner has been notified to remove the cows from the premises.

While the general condition of the cow stables is fair, yet it is still to be complained that cows which are kept in close quarters and do not have good pasturage and room for exercise, will give good milk.

I would recommend that some action be taken to improve the condition of the cow stables in the city limits. While as a rule complaints are not made against these stables, nevertheless they are a nuisance to the entire neighborhood in which they exist.

| | |
|---|-------|
| No. of wagons halted for inspection | 1,456 |
| No. of cans of milk inspected on same | 3,039 |
| No. of lactometer tests | 1,287 |
| No. of stores visited..... | 1,472 |
| No. of samples taken..... | 13 |
| No. of cans of milk inspected from | 1,384 |
| No. of lactometer tests | 647 |
| No. of samples taken..... | 135 |
| No. of samples of ice taken..... | |
| No. of samples of milk taken..... | |
| No. of cow-stable inspections | 23 |
| No. of animal permits issued..... | 35 |
| No. of animals licensed | 1,170 |

DISINFECTING CORPS

This division consists of a Chief and four Inspectors detailed for that purpose.

Their duties consist in placarding all houses where contagious diseases are reported, visiting and keeping under supervision all houses thus quarantined, and disinfecting and removing the cars or houses placarded, when reported as ready by the attending physician in charge.

The work of this station is such that can be desired under the prevailing circumstances. The old method of disinfection with sulphur has been largely abolished, and disinfecting by Formaldehyde Gas has been substituted. Acting on a suggestion made by Your Executive Officer some Bacteriological tests were recently made with Formaldehyde Gas to determine its value. The tests were made under the supervision of the Bacteriologist. A room was selected and properly prepared by causing the cracks and crevices of all doors and windows to be hermetically sealed. At various places in the room plugs of cotton and pieces of gauze which had been previously soaked in cultures of *Diphtheria*, were distributed, some placed near the door, some hanging on a nap, some close to the place at which the gas was introduced into the room, and some at the most remote corner of the room. This was done in order to determine how thoroughly the disinfectant was distributed through the room, and the most remote pieces of cotton exposed were at least fourteen feet from the point at which the gas was introduced. The room contained at least 3,100 cubic feet of air space, and the amount of formaldehyde solution employed was 2,300 cubic feet, which is somewhat less than is ordinarily used by the regular disinfecting work of the Sanitary Corps for the same air space.

After the exposure, the previously inoculated material was introduced into culture media at the Laboratory, and at the same time the controls were made with some of the material, which had been prepared at the same time, but not exposed to the disinfectant. A very small amount of material was exposed to formaldehyde, and of

the tubes containing the exposed material developed any growth, even after several days incubation, while the tubes containing the material which had not been exposed to the gas contained a profuse growth at the end of twenty-four hours.

The generator used in these tests is one which produces a strong, sustained concentration while the gas is being produced and enables the person in charge to regulate the amount of gas so as not to expose himself to the vapor. The tests made prove the value of Formaldehyde as a disinfectant for exposed surfaces, and establish the fact that the gas is a very powerful germicide, and is not only soluble in water, but also in any confined space.

The following is a summary of the work performed by this division during the year

| | |
|-------------------------------------|-------|
| Diphtheria placarded | 959 |
| Scarlet Fever placarded | 1,367 |
| Typhoid Fever (Not placarded) | 105 |
| Total cases. | 2,431 |
| SPECIAL | |
| Diphtheria | 881 |
| Scarlet Fever.. | 1,252 |
| Phthisis Pulmonalis | 45 |
| Special | 40 |
| | 2,178 |
| No. of rooms disinfected | 27 |
| No. of visits made | 3 |
| No. of nuisances found and reported | 17 |

THE CITY DISPENSARY AND OUT DOOR POOR DIVISION.

The demands on this division at the Dispensary is constantly growing. The amount of work performed and

medical services rendered by its various clinics is surprising when we stop to consider the lack of room available.

During the year there were 25,657 patients treated, and 33,986 prescriptions dispensed.

The following is a detailed statement of the services rendered by the Hospital clinics, together with the services rendered by the District Physicians, and treatment of what skin diseases the Out Door Dispensary.

PERSONS TREATED AT THE FOLLOWING CLINICS

| | |
|----------------------------------|--------|
| Medical.... | 3,924 |
| Surgical..... | 3,084 |
| Diseases of Skin..... | 1,883 |
| Diseases of Children..... | 1,176 |
| Diseases of Women..... | 1,439 |
| Lessons in Health..... | 1,000 |
| No. of Vaccinations.. | 6,391 |
| No. of Examinations.. | 1,565 |
| No. of Clinic Prescriptions..... | 22,219 |

NUMBER OF DISTRICT PRESCRIPTIONS DISPENSED AS FOLLOWS

| | |
|--|--------|
| 1st District..... | 982 |
| 2nd "..... | 1,194 |
| 3rd "..... | 846 |
| 4th "..... | 1,168 |
| 5th "..... | 1,418 |
| 6th "..... | 692 |
| 7th "..... | 666 |
| 8th "..... | 623 |
| 9th "..... | 1,787 |
| 10th "..... | 1,604 |
| 11th "..... | 787 |
| Total No. of District Prescriptions..... | 11,767 |

RECAPITULATION

| | |
|---|--------|
| Total No. of Patients Treated..... | 25,657 |
| Total No. of Prescriptions Dispensed..... | 33,986 |

SUMMARY OF SERVICES RENDERED BY DISTRICT PHYSICIANS.

| | 1st Dist.—Dr W. Gauch. | 2d Dist.—Dr H. Long. | 3d Dist.—Dr T. B. Hopper.—3 months. | 4th Dist.—Dr W. M. Goodwin.—9 months. | 5th Dist.—Dr O. H. Roth. | 6th Dist.—Dr E. Eisenburg. 3½ months. | 7th Dist.—Dr J. A. Hofman.—8½ months. | 8th Dist.—Dr F. Webner. | 9th Dist.—Dr V. Nager. | 10th Dist.—Dr E. Stachlin. | 11th Dist.—Dr T. P. Edwards. | 12th Dist.—Dr H. Hart. | 13th Dist.—Dr F. Hagney. |
|--|------------------------|----------------------|-------------------------------------|---------------------------------------|--------------------------|---------------------------------------|---------------------------------------|-------------------------|------------------------|----------------------------|------------------------------|------------------------|--------------------------|
| Actual No. of fami | 3 | 4 | 41 | 102 | 111 | 147 | 100 | 133 | 100 | 133 | 100 | 133 | 100 |
| No. of sick prescribed for .. | 373 | 548 | 149 | 372 | 741 | 324 | 476 | 433 | 537 | 486 | 514 | 456 | 398 |
| No. of patients made | 5 | 2 | 5 | 56 | 49 | 4 | 39 | 2 | 6 | 43 | 34 | 18 | |
| No. of patients to hospital | 13 | 32 | 12 | 26 | 34 | 10 | 24 | 17 | 37 | 25 | 22 | 21 | 10 |
| No. of circulars distributed on infant feeding | 28 | 9 | 0 | 5 | 0 | 0 | 0 | 3 | 12 | 24 | 20 | 12 | 24 |

RECAPITULATION.

| | Actual No. of houses visited | Actual No of families visited. | Sick prescribed for | Found treated by other physicians. | Total No. of visits made. | No of patients sent to hospital. | No of doctors | No of circulars distributed. |
|--------------|------------------------------------|--------------------------------------|---------------------------|--|---------------------------------|--|------------------|------------------------------------|
| 1st District | 384 | 304 | 373 | 1 | 506 | 13 | | 28 |
| 2d | 11 | 58 | 54 | 5 | 451 | 32 | 14 | 9 |
| 3 | 30 | 40 | 52 | 7 | 586 | 38 | 14 | 5 |
| 4th | 65 | 171 | 74 | 56 | 496 | 34 | | 0 |
| 5th | 418 | 106 | 900 | 53 | 1521 | 34 | 1 | 0 |
| 6th | 355 | 326 | 43 | 39 | 581 | 17 | | 3 |
| 7th | 47 | 431 | 53 | 2 | 496 | 37 | 12 | 12 |
| 8th | 0 | 517 | 48 | 6 | 542 | 25 | | 34 |
| 9th | 85 | 116 | 51 | 43 | 487 | 22 | 13 | 20 |
| 10th | 1 | 438 | 45 | 34 | 554 | 21 | | 43 |
| 11th | 3 | 423 | 39 | 18 | 553 | 10 | | 25 |
| Total | 1000 | 517 | 590 | 264 | 8073 | 283 | 118 | 179 |

CLASSIFICATION OF CHIEF CAUSES OF DEATH
TREATED BY DISTRICT
PHYSICIANS.

| INFECTIOUS. | | DIGESTIVE. | |
|------------------------|----|------------------------------------|---|
| Diphtheria | 9 | Inanition | 1 |
| Scarlet Fever | 2 | Acute Gastritis..... | 1 |
| Phthisis | 25 | Diarrhoeal Diseases | 1 |
| | | Ingestive | 1 |
| BRAIN AND NERVOUS. | | CONSTITUTIONAL and OTHER DISEASES. | |
| Apoplexy.. | 1 | Carcinoma. | 1 |
| Meningitis | 6 | Fibroid Tumor | 1 |
| PULMONARY. | | Rachitis | |
| Pleurisy.. | 1 | Cirrhosis of Liver.. | |
| Pneumonia | 4 | Nephritis | |
| Emphysema .. | 1 | Endocarditis | 1 |
| Capillary Bronchitis.. | 1 | Puerperal | 1 |
| Bronchitis | 2 | Nephritis. | |
| | | Other Causes | 1 |

STREET PAVING AND SEWERS.

During the year 1897 there were caused to be built, by the Board of Street and Water Commissioners, 10,565 feet of brick and 19,232 feet of pipe sewers, the same being provided with 178 manholes and 31 basins.

Of the streets paved, $1\frac{25}{100}$ miles consisted of asphalt, 2.19 miles of brick, 28.52 miles of granite and 12.34 miles of cobble. Total making a total of 44.10 miles of streets paved during the year.

The following table furnished by City Surveyor Adams shows the total miles of streets paved and sewers built in the city up to January 1st, 1898.

| STREETS PAVED | | SEWERS BUILT. | |
|---------------|-------------|----------------|-------------|
| Asphalt | 20.08 miles | Brick | 56.42 miles |
| Brick | 2.19 " | Pipe (Public) | 63.98 " |
| Cobble | 28.52 " | Pipe (Private) | 19.11 " |
| Granite | 12.34 " | | |
| Total | 11.28 " | Total miles | 139.51 |
| | 14.98 " | | |
| | | Sewer Basins | 2,493 |
| Total | 26.26 " | | |

In addition to the above, the Board of Street and Water Commissioners has caused notices of intention to be read for street paving and sewers for the year 1898, as follows:

| SEWERS. | | STREET PAVING | |
|---------|-------------|---------------|-------------|
| Pipe | 12,030 feet | Asphalt | 11,870 feet |
| Brick | 4,612 " | Granite | 22,860 " |
| | | Pipe | 2,480 " |
| | | Cobble | 250 " |

To the Board of Street and Water Commissioners I desire to express the thanks of the Board of Health not only for the uniform courtesy always extended to its

Executive Officer, but for the prompt and cordial manner displayed in co-operating with Your Honorable Body in all matters pertaining to the sanitary regulations of the city.

Proper drainage facilities, well paved and cleanly streets are not only primary factors in regulating the sanitary conditions of the city, but are highly responsible for its mortality record.

A detailed statement of the receipts and disbursements of the Department, showing the costs and maintenance of the various divisions coming under its control, together with the reports of the Superintendent of the Bureau of Contagious Diseases, Bacteriologist and Chemist of the Bureau, with some very interesting data arranged by Professor George C. Smith, M. D., is appended.

The report as to the Sanitary requirements of the city and the needs of the Department, which are most urgent, in brief are as follows:

- 1st. A Public Disinfecting Station;
- 2nd. Isolation Hospital for Diphtheria and Scarlet Fever;
- 3rd. Separation and Collection of Garbage,
- 4th. A Public Abattoir,
- 5th. An Emergency Hospital and Ambulance Service;
- 6th. A Suitable building wherein the Divisions of the Department could be concentrated under one roof.

In conclusion, I desire to thank the Members of the Board of Health for the confidence which they have reposed in me and for the cordial support afforded me during the past year, in carrying on the work of the Department.

I also desire to thank the heads of the different Divisions and the employees in their charge, for the

cheerfulness and alacrity with which they have performed their arduous and often not very pleasant duties.

Our work, although necessarily aggressive at times, is not intended as one of persecution, but one looking to the welfare of the entire community, and I am satisfied that the public at large so recognize it.

Yours respectfully,

DAVID D. CHANDLER,

Health Officer

RECEIPTS AND DISBURSEMENTS OF THE BOARD OF HEALTH FOR THE YEAR ENDING DEC. 31, 1897.

| | | |
|---|-------------|--------------------|
| Balance on hand January 1, 1897..... | \$ 8,200 24 | |
| Appropriated by Common Council..... | 30,000 00 | |
| Dead animal contract. | 465 00 | |
| Fines and costs collected (First Precinct Court), | 29 35 | |
| | | <u>\$38,684 59</u> |

OFFICE RECEIPTS.

| | | |
|---|-------------|-----------------|
| Filing plans (Plumbing Department)..... | \$ 2,410 00 | |
| Scavenger permits..... | 139 80 | |
| Animal permits | 117 60 | |
| Scavenger licenses | 140 00 | |
| Sale of vaccine at Dispensary..... | 8 00 | |
| Chicken slaughter house permit. | 1 00 | |
| | | <u>2,816 40</u> |

BACTERIOLOGICAL DIVISION.

| | | |
|---|----------|--------------------|
| Bacteriological examinations (outside of city).. | \$ 65 50 | |
| SALE OF A. T. OUTSIDE OF CITY. | | |
| 128 vials at \$1.00 per vial..... | 128 00 | |
| 134 vials to the trade at \$1.00 per vial less 10%. | 120 60 | |
| 6 vials (wholesale) less 20 | 4 80 | 318 90 |
| Total..... | | <u>\$41,819 89</u> |

DISBURSEMENTS.

SANITARY DIVISION SALARIES.

| | | |
|---|-------------|------------------|
| Health Officer..... | \$ 2,500 00 | |
| Superintendent Bureau Contagious Diseases.. | 500 00 | |
| Chief of Disinfecting Corps..... | 900 00 | |
| Clerks (2)..... | 2,400 00 | |
| Stenographer..... | 520 00 | |
| Chemist..... | 1,000 00 | |
| Meat Inspectors (2)..... | 2,000 00 | |
| Plumbing Inspectors (3)..... | 3,000 00 | |
| Milk Inspector..... | 782 50 | |
| Sanitary Inspectors 15 detailed to disinfect- ing corps 14 | 11,717 50 | |
| Janitors | 180 00 | |
| Meteorologist | 72 00 | |
| | | <u>25,572 00</u> |

Amount brought forward...

\$25,572 00

BILLS.

| | | |
|--|----------|----------|
| Rent of office (11 months)..... | \$733 26 | |
| Petty cash (postage, carfare, telegrams, etc) | 270 00 | |
| Stationary..... | 171 68 | |
| Telephones (2) and toll service.. | 158 58 | |
| Carriage hire..... | 121 60 | |
| Traveling and hotel expenses Annual Convention of American Public Health Association, Philadelphia, (5 days) Health Officer and Bacteriologist | 90 00 | |
| Office furniture..... | 69 71 | |
| Incandescent light for office | 54 30 | |
| Ice for office | 32 50 | |
| New Jersey Clipping Bureau (newspaper clippings)..... | 25 00 | |
| Coal and wood | 22 55 | |
| Mimeograph supplies | 18 60 | |
| Traveling expenses to Branchville and return (Fulboam's Creamery Investigation) Health Officer, Bacteriologist and Veterinarian... | 16 60 | |
| Awnings.. . . . | 11 00 | |
| Oil of peppermint (plumbing test) . . . | 10 00 | |
| Typewriter supplies | 7 50 | |
| Newark City Directory. | 5 00 | |
| Varnish | 4 49 | |
| Dues American Public Health Association 1 year | 3 00 | |
| Furniture repairs.. . . . | 2 25 | |
| Rubber stamp..... | 2 00 | |
| | | 1,829 02 |

DISPENSARY SALARIES.

| | | |
|---|-------------|-------------|
| City Apothecary.. . . . | \$ 1,200 00 | |
| Assistant City Apothecary..... | 900 00 | |
| Second Assistant City Apothecary (5 months and 18 days at \$50 per month, since dispensed with) | 280 65 | |
| Dentist | 162 56 | |
| Janitress | 180 00 | 2,723 21 |
| Carried forward | | \$30,124 23 |

Amount brought forward.

\$30,120.21

EXPENSES

| | | |
|-------------------------|--------|-------|
| Drugs. | \$ | 43.71 |
| Vaccine | 110.00 | |
| Surgical instruments. | 15.00 | |
| Coal. | 43.00 | |
| Stationery and printing | 3.25 | |
| Washing towels. | 20.00 | |
| Ice | 5.00 | |
| Lamp | 12.00 | |
| Cleaning | 11.00 | |
| Gas. | 8.00 | |
| Newark City Directory | 60.00 | |
| Repairing awnings. | 2.00 | |
| Repairing sink. | 1.14 | |

1,552.21

DISINFECTING CORPS

EXPENSES

| | | |
|--------------------------|-------|-------|
| Woolacord | \$ | 56.50 |
| Portable steam generator | 46.00 | |
| Contagious disease car | 28.50 | |
| Box for generators | 17.38 | |
| Stove, piping, etc. | 9.89 | |
| Carfare (money advanced) | 7.30 | |
| Newark City Directory | 5.00 | |
| Copper measures | 2.56 | |
| Lock and keys | 2.35 | |
| Paper box | 30.00 | |

172.53

MAINTENANCE OF ISOLATION HOSPITAL.

| | | |
|------------------|----|--------|
| Orderly's salary | \$ | 576.00 |
|------------------|----|--------|

EXPENSES

| | | |
|--|-------|-------------|
| Newspapers May, 1905 to January, 1906 | 10.50 | |
| Coal | 15.00 | |
| Tar paper (repairing roof) | 5.38 | |
| Board of Street and Water Commissioners (water rent) | 5.15 | 618.09 |
| Carried forward. | | \$32,500.36 |

| | |
|-----------------------------|-------------|
| Amount brought forward..... | \$32,500 36 |
|-----------------------------|-------------|

BACTERIOLOGICAL DIVISION.

SALARIES

| | | |
|---|-------------|----------|
| Bacteriologist. | \$ 1,500 00 | |
| Assistant Bacteriologist | 600 00 | |
| Culture Collector | 750 00 | |
| Porter 7 months at \$35 per month | 245 00 | |
| | <hr/> | 3,095 00 |

BILLS.

| | | |
|---|-------------|-------------------|
| Board of horses (5) and professional services for production of antitoxin..... | \$ 1,215 45 | |
| Petty cash (postage, etc)..... | 150 00 | |
| Laboratory supplies (chemicals, flasks, boxes, etc.) | 125 89 | |
| Guinea pigs (7 dozen)..... | 84 00 | |
| Stationery index cards, case circulars, etc. . | 66 80 | |
| Horseshoeing (antitoxin horses)..... | 70 62 | |
| Tetanus antitoxin..... | 25 00 | |
| Repairing incubators..... | 17 15 | |
| Stable sheets | 5 95 | |
| | <hr/> | 1,760 86 |
| District physicians (11) at \$400 per annum..... | | 4,400 00 |
| Total | | <hr/> \$41,756 22 |

RECAPITULATION

| | |
|--------------------------------------|-----------------|
| Total receipts..... | \$41,819 89 |
| Total disbursements.. | <hr/> 41,756 22 |
| Balance on hand January 1, 1898. . . | <hr/> \$63 67 |

REPORT OF THE BUREAU OF CONTAGIOUS DISEASES.

To the Honorable, The Board of Health, Newark, N. J.

GENTLEMEN I have the honor, to present the following report for your consideration, embracing the Contagious Diseases and Mortality, under your charge, for the year 1897:

(1.) THE DEATH RATE

For the year is fixed at 17.43 per thousand—this is remarkably low and compares very favorably with previous years. The total deaths were 4,010 on an estimated population of 230,000. (See Table I—annexed.)

(2.) CONTAGIOUS DISEASES.

(a) SCARLET FEVER: During 1897 there were 1,358 cases with 54 deaths—the number of cases was much larger than previous years, but the mortality is light—there is, however, no surer that a return epidemic may not carry a much heavier mortality—the variation in this regard being well known to you. (See Table II.)

(b) TYPHOID FEVER. There were 103 cases with 33 deaths—this is the lightest mortality in four years past. I would ask the Board to take into consideration the fact

that the Hospital Mortality of cases incurred out of this city is herein included (See Table III.)

(c) SMALL POX: There are no recorded cases or deaths since 1895; this freedom from small pox is due to the thorough vaccination given this city at the last epidemic, and at a considerable expense to this Board. To-day, however, it is estimated that there are 5,000 people who are unvaccinated. I consider these a real danger. Many are children under school age. I would earnestly recommend for vaccination any healthy child six months or over. Any epidemic will demonstrate the urgent need of a Municipal Fever Hospital for our people. (See Table IV.)

(d) DIPHTHERIA: During 1897, there were reported 969 cases with 137 deaths. We divide these cases for comparison of results into two classes:

1. 563 cases, Antitoxin used—deaths 61; equals 10.83%
2. 406 mild cases, Antitoxin not used—deaths 76; equals 18.71%.

The success of "Newark Antitoxine" is assured. No fatal or grave symptoms have been traced to it even in enormous doses. I would therefore advocate its early use in practically untreated cases, especially in laryngeal cases whose mechanical conditions become rapidly dangerous. Diphtheria to-day is a curable disease, with a favorable prognosis.

(e) CONSUMPTION: The deaths from consumption were 497. Our reports of cases are not complete. One seventh of mankind die of Tuberculosis. Newark is not above the average in this regard. In this disease, infective sur-

roundings play a large part. As a measure to lessen its spread and mortality, a rigid disposal of all its sputa by antisepsis is an urgent necessity.

(3.) VITAL STATISTICS

There is a growing feeling that these should be under the control of the Board—Births, Marriages, Deaths, and granting of Burial permits are proper subjects and some system of registration of practising physicians.

The present system of classification of diseases is not satisfactory. To secure uniformity in this regard, the passage of a State law is hereby advocated, especially if based on the Bertillon System, a summary of which can be found in the table annexed.

(4.) LODGING HOUSES.

I include here not only Lodging Houses proper but also Tenements whose population is of such shifting character as to place them on practically the same footing. Many of these houses are in the central portion of the city. For the following reasons a law is advocated:

1. That their sanitary requirements (washbasins, urinals, &c.) should be on the highest possible sanitary plans.

2. The possibility of "*Germ. Diseases*" and the resulting expense to this Board, the air of such places being usually loaded with the products of combustion and respiration, no tenement law can be too rigid, and the extension of the fire limits aids in the character of the buildings.

(5.) GENERAL HEALTH.

Considering the mixture of population and diversity of its industries, Newark is a healthy city. Its milk and water supply are under close and constant inspection. I would advocate also the closest possible inspection of all food offered for sale, publicly exposed, particularly vegetables and fish. The question of the adulteration of food, must in time, become a subject for consideration by this Board.

If it were possible to carry out to their fullest extent the primary principles of cleanliness, fresh air, sunlight and good water, I see no reason why infectious diseases should not cease to exist.

Respectfully submitted,

E. E. WORL, M. D.,

Chief Bureau Contagious Diseases.

TABLE I.

CLASSIFICATION—SOME CHIEF CAUSES OF DEATH—1897

| | |
|-----------------------------|-----|
| Phthisis | 497 |
| Influenza | 133 |
| Typhoid Fever | 33 |
| Scarlet Fever | 54 |
| Diarrhoea and Enterocolitis | 181 |
| Pneumonia | 438 |
| bronchitis | 125 |
| Heart Disease | 329 |
| Meningitis | 234 |
| Convulsions | 152 |
| Apoplexy | 256 |
| Hepatitis | 238 |
| Chorea Infantum | 110 |
| Senility | 67 |
| Accident and Violence | 179 |
| Other Diseases | 954 |

Total Deaths, 4,010 Population, 230,000. Rate per 1,000—17.43

| Year | POPULATION | NO OF DEATHS. | DEATH RATE. |
|------|------------|---------------|-------------|
| 1894 | . 203,923 | 4,543 | 22.28 |
| 1895 | . 215,725 | 4,616 | 21.37 |
| 1896 | . 225,000 | 4,716 | 20.96 |
| 1897 | . 230,000 | 4,010 | 17.43 |

TABLE II.

SCARLET FEVER.

| YEAR. | CASES. | DEATHS. |
|-------|--------|---------|
| 1854 | 1,145 | 16 |
| 1855 | 623 | 35 |
| 1856 | 537 | 17 |
| 1857 | 1,358 | 64 |

TABLE III.

TYPHOID FEVER.

| YEAR. | CASES. | DEATHS. |
|-------|--------|---------|
| 1854 | 7 | 34 |
| 1855 | 4 | 86 |
| 1856 | 12 | 47 |
| 1857 | 163 | 33 |

TABLE IV.

SMALL POX.

| YEAR. | CASES. | DEATHS. |
|-------|--------|---------|
| 1854 | 154 | 18 |
| 1855 | 18 | 2 |
| 1856 | 6 | 0 |
| 1857 | 6 | 0 |

TABLE V.

BERTILLON CLASSIFICATION OF CAUSES OF DEATH

Reported to International Statistical Institute, 1893 Adopted State
of Michigan, January 1, 1898.

GENERAL DISEASES.

I.—Epidemic Diseases.

II.—Other General Diseases

LOCAL DISEASES.

III.—Diseases of the Nervous System and of the Organs of Sense

IV.—Diseases of the Circulatory System

V.—Diseases of the Respiratory System.

VI.—Diseases of the Digestive System

VII.—Diseases of the Genito-Urinary System.

VIII.—Puerperal Diseases

IX.—Diseases of the Skin and Cellular Tissue

X.—Diseases of the Loco Motor System

XI.—Malformations

XII.—Diseases of Infancy

XIII.—Diseases of Old Age

XIV.—Violence

(a) SUICIDE. (b) ACCIDENT. (c) HOMICIDE

XV.—Causes Ill-defined.

POPULATION OF NEWARK, BY WARDS, 1897

| Wards | Census 1895 | Per Cent of Total Each Ward. | Estimated Population, 1897. | Rate Increase, 1890-1895. |
|--------|----------------|------------------------------------|-----------------------------------|---------------------------------|
| 1 | 13,011 | 6.0 | 13,940 | 1.0349 |
| 2 | 12,594 | 5.8 | 13,478 | .. |
| 3 | 19,615 | 9.1 | 21,014 | .. |
| 4 | 10,700 | 5.0 | 11,466 | |
| 5 | 13,907 | 6.5 | 14,911 | ... |
| 6 | 14,766 | 6.8 | 15,836 | .. |
| 7 | 13,517 | 6.3 | 14,495 | .. |
| 8 | 10,514 | 4.9 | 11,258 | |
| 9 | 10,566 | 4.9 | 11,328 | |
| 10 | 16,718 | 7.8 | 17,916 | |
| 11 | 15,572 | 7.2 | 16,691 | . |
| 12 | 14,540 | 6.7 | 15,581 | .. |
| 13 | 15,941 | 7.4 | 17,084 | |
| 14 | 20,670 | 9.6 | 22,147 | . |
| 15 | 13,041 | 6.0 | 13,963 | |
| Total, | 215,672 | 100.0 | 231,108 | 1.0349 |

INFECTIOUS DISEASES REPORTED BY WARDS

| Wards | Estimated Population | Diphtheria, including Membranous Croup. | Scarletina | Typhoid Fever | Small pox |
|-------|-------------------------|--|------------|------------------|--------------|
| 1 | 13,940 | 69 | 55 | 13 | |
| 2 | 13,478 | 59 | 60 | 7 | . |
| 3 | 21,014 | 102 | 181 | 6 | . |
| 4 | 11,466 | 17 | 58 | 5 | |
| 5 | 14,911 | 71 | 73 | 6 | |
| 6 | 15,836 | 67 | 108 | 6 | |
| 7 | 14,495 | 83 | 117 | 4 | |
| 8 | 11,258 | 50 | 60 | 1 | . |
| 9 | 11,328 | 20 | 45 | 7 | |
| 10 | 17,916 | 56 | 160 | 12 | . |
| 11 | 16,691 | 61 | 100 | 9 | |
| 12 | 15,581 | 86 | 70 | 12 | |
| 13 | 17,084 | 66 | 70 | 3 | |
| 14 | 22,147 | 84 | 13 | 3 | |
| 15 | 13,963 | 76 | 87 | 7 | |
| Total | 231,108 | 877 | 1,383 | 103 | |

REPORT OF THE BACTERIOLOGICAL DIVISION.

To the Honorable, The Board of Health, Newark, N. J..

GENTLEMEN - Herewith is respectfully submitted the Third Annual Report of the Bacteriological Division for the year ending December 31, 1897.

The work at the Laboratory has been pursued along practically the same lines as during the two preceding years, excepting that additions have been made in the scope of the work when scientific discovery made it possible, as in the Widal serum test for Typhoid Fever, or when necessity indicated, as in the examination of water from various points on the Passaic water shed, to determine sources of pollution in the City Water Supply. It is, therefore, especially gratifying to be able to report to Your Honorable Body that the Medical Profession of Newark, continues to freely use the Laboratory, not only for the diagnosis of Diphtheria, but also for Tuberculosis and Typhoid Fever, as well as in using the Diphtheria Antitoxin produced by the Board.

The total number of cases of Diphtheria which occurred in the city during the year, shows a decrease, as compared with 1896, and a decided reduction is noticed in the number of deaths from this disease. In 1896 there were 218 deaths from Diphtheria, while in 1897 we had

138 deaths from the same cause, which is a lower death rate from this disease for 1897 than any of the three preceding years, which were as follows :

DEATHS FROM DIPHTHERIA.

| YEAR. | DEATHS | YEAR. | DEATHS. |
|------------|--------|------------|---------|
| 1894..... | .180 | 1896 | 218 |
| 1895 | .306 | 1897 | 138 |

The diphtheria cultures received at the Laboratory during the year may be classed as follows :

| | |
|---|-------|
| Primary cultures for diagnosis. | 1,490 |
| Secondary cultures for disinfection. | 1,135 |
| Total..... | 2,625 |

The examination of primary cultures showed that 693 contained Diphtheria Bacilli, or about 45% of suspected cases were true. Many of these cultures were taken from patients who had only very slight symptoms, or from persons who had only been exposed to the disease which accounts for the low percentage containing the Diphtheria Bacilli. This indicates that more attention is being given to suspicious throat symptoms, which will ultimately result in causing Diphtheria to be a comparatively rare disease.

DIPHTHERIA ANTITOXIN

The production of Antitoxin has been continued during the year and 1,724 bottles were produced, which is an amount somewhat over 17 quarts. Of this quantity, we find, there were used in Newark 1,321 bottles; sold outside of the city, by the Board 263 bottles, leaving on hand at the end of the year 137 bottles.

The use of the remedy by Newark physicians in the

treatment of Diphtheria, as well as the results obtained, may be seen by the following table, which shows the number of cases treated and not treated with the remedy and contrasts the results for the three preceding years.

DIPHTHERIA CASES

| ANTITOXIN USED. | | ANTITOXIN NOT USED |
|---------------------------------|--|---------------------------------|
| 1895—374 cases, 52 deaths, 13% | | 1895—937 cases, 221 deaths, 23% |
| 1896—905 cases, 106 deaths, 11% | | 1896—356 cases, 112 deaths, 21% |
| 1897—563 cases, 61 deaths, 10% | | 1897—406 cases, 76 deaths, 18% |

The following report which was prepared by Dr J C Houston, Assistant Bacteriologist to the Board, and shows some interesting results, is inserted here as it was prepared from the Laboratory records.

REPORT OF ASSISTANT BACTERIOLOGIST, TO THE BACTERIOLOGIST

DEAR SIR:—During the year 164 physicians have made use of the Laboratory as an aid in the diagnosis of Diphtheria, Tuberculosis and Typhoid Fever. Of the 1,490 primary cultures 693 were found to contain the Klebs Loeffler Bacilli. In 373 of these true cases a positive diagnosis of Diphtheria was made by the attending physician, leaving 320, or about 46% in which the diagnosis was more or less obscure to the physicians in charge. Thus it can be seen that in 46% of the true cases, the examination of the culture from the throat of the affected person assisted the physician in making a positive diagnosis.

About 19% (3295 cases) of all primary cases reported, were under 5 years of age; of this number 73 were Laryngeal Diphtheria. The following table shows the

mortality in the Laryngeal cases under 5 years treated and not treated with Antitoxin. It is generally conceded that at this age Laryngeal Diphtheria is most fatal.

LARYNGEAL CASES UNDER FIVE YEARS

| | CASES | DEATHS |
|-------------------|-------|--------|
| With Antitoxin | 55 | 14 |
| Without Antitoxin | 18 | 12 |

25.4%

.66.6%

The following table includes all cases under 5 years, without reference to the location of the membrane.

ALL CASES UNDER FIVE YEARS

| | CASES | DEATHS |
|-------------------------------|-------|--------|
| With Antitoxin | 182 | 42 |
| Without Antitoxin, mild cases | 113 | 59 |

23%

.52%

A comparison has been made in the number of days of quarantine in cases treated and not treated with Antitoxin, with the following results:

The average days of quarantine in all cases, without regard to location of membrane or administration of Antitoxin, was 10.4 days.

| | AVERAGE DAYS |
|--|--------------|
| When the membrane was on tonsils and Antitoxin given | 9+ |
| " " " " " " not given | 9+ |
| " " " Laryngeal " " given | 11.1 |
| " " " " " not given | 11.1 |
| " " " Nasal " " given | 12.5 |
| " " " " " not given | 15.2 |

From the above it will be seen that there is little or no difference in the average days of quarantine in the two classes of cases.

Respectfully,

J. C. HOUSTON, M. D.,

Asst. Bacteriologist

TUBERCULOSIS

A very decided increase is noticed in the number of specimens sent to the Laboratory from persons suspected of having this disease. It does not necessarily follow that there has been any material increase in the number of persons suffering from Tuberculosis, but it does mean that finding Tubercle Bacilli in the discharges is frequently the only positive early sign of the existence of the disease.

During the year 1900 specimens of sputa were received and in 279 the Tubercle Bacilli were found.

In examining the Laboratory records for the year, we find that the physicians, for whom the examinations were made, furnished data regarding the age and sex of 229 persons in whose sputum the Tuberc Bacillus was found, and the following table was prepared from these cases to show the relations of sex, age and the occurrence of the disease.

CASES OF TUBERCULOSIS

| AGE | MALE | FEMALE |
|---------------------|-----------|----------|
| Under 10 years..... | 1 | 0 |
| 10 to 15 years..... | 1 | 6 |
| 15 " 20 "..... | 9 | 12 |
| 20 " 30 "..... | 46 | 33 |
| 30 " 40 "..... | 48 | 19 |
| 40 " 50 "..... | 26 | 10 |
| 50 " 60 "..... | 15 | 1 |
| 60 " 70 "..... | 0 | 1 |
| 70 and over..... | 0 | 1 |
| | <hr/> 146 | <hr/> 83 |

This table clearly shows that no age is exempt from the disease, and it also shows that it is during the most

active and useful period of life by far the greatest number of people are attacked.

TYPHOID FEVER

During the latter part of 1896, by direction of the Board of Health, the serum test for Typhoid Fever was made a part of the routine work of the Laboratory, and from 1897 there were received for examination 114 specimens of blood from persons whom their physicians had reason to suspect, were suffering from the disease. While the diagnostic value of this test has not been as great as we were at first inclined to believe; yet from our experience during the year we would regard it as valuable only when the reaction is prompt and positive, and such cases may be regarded as being Typhoid Fever, or at least suffering from Typhoid infection. As there are found all degrees of reaction, varying from a prompt and positive one to a totally negative result, it is necessary to be familiar with the Typhoid culture used for making the test, and the minimum amount of blood which will produce the reaction, if present, in order to arrive at conclusions. Some specimens have been examined from patients at the end of the first, or beginning of the second week of the disease, and a negative result was produced; but when at the end of two or three days another specimen was obtained, a positive reaction occurred. It would seem that this reaction is present in the blood of all persons who take Typhoid Fever at some time during the course of the disease, especially if they recover, but there is reason to believe that some persons have the disease and die from it before the blood acquires

the property of producing the so-called "Widal reaction."

There have been 72 water examinations and 5 milk tests made during the year for Typhoid Bacteria, and an extended examination of the streams and reservoirs on the Pequannock watershed to determine sources of pollution in the City Water Supply. (A report of which has been submitted.)

During November and December an outbreak of Typhoid Fever occurred in several places outside of, but adjacent to Newark, and attention was directed to the milk supply. Investigation showed that this city received some of its supply from the same place as the affected communities. This resulted in a visit to Branchville, Sussex County, N. J., in company with Mr. D. D. Chandler, Health Officer, and Dr. W. Runge, the Veterinarian of the Board. Samples of water were obtained and examined, a detailed report was submitted at that time, on which the Board took suitable action.

REPORT OF WORK PERFORMED BY CULTURE COLLECTOR FOR YEAR ENDING DECEMBER 31, 1897

| | |
|---|-------|
| No. of Vials of Antitoxin delivered at Culture Stations | 1,170 |
| No. of Sputa cups delivered, | 474 |
| No. of Typhoid Fever tests delivered, | 160 |
| No. of Culture boxes delivered to different Culture Stations, . | 1,783 |
| No. of Diphtheria cultures collected, | 2,106 |
| No. of Sputa boxes collected | 1,66 |
| No. of Typhoid Fever tests collected | 45 |
| Samples of Water delivered for Bacteriological examination, . | 51 |

The City Water Supply was examined each month during the year, and the general results obtained are presented in the following table

GAS PRODUCTION IN GLUCOSE BOUILLON

| DATE | NO. BOTTLES | 100° | 200° | 300° | 100° | 200° | 300° | CHARACTER OF PRECIPITATES |
|--------------------|-------------|------|------|------|------|------|------|---------------------------------|
| Jan. 23d | 135 | — | — | — | — | — | + | Neg for Col. Com. or Typhoid |
| Feb. 26th. . | 450 | — | — | — | — | — | + | Neg for Col. Com. or Typhoid. |
| March 24th. . . . | 90 | — | — | + | + | + | + | Susp. Bac. resembling Coli. |
| April 23d. . . . | 80 | — | + | + | + | + | + | Col. Com. found on plates |
| May 25th. . . . | 320 | — | + | — | + | + | + | Col. Com. found on plates |
| June 26th. . . . | 87 | + | — | + | + | + | + | Col. Com. found on plates |
| July 26th. | 137 | — | — | — | — | + | + | Col. Com. found only in 5 C. C. |
| Aug. 19th. . . . | 130 | — | — | — | — | — | + | Col. Com. found only in 5 C. C. |
| Sept. 11th. . . . | 22 | — | — | — | — | — | + | Col. Com. found only in 5 C. C. |
| Oct. 21st. | 180 | — | — | — | — | — | + | Col. Com. found only in 5 C. C. |
| Nov. 20th. | 100 | — | — | — | — | — | + | Col. Com. found only in 5 C. C. |
| Dec. 23d. | 350 | — | — | — | — | — | + | Col. Com. found only in 5 C. C. |

Very respectfully submitted,

RICHARD N. CONNOLLY, M. D., Bacteriologist.

CHEMIST'S REPORT.

To the Honorable, The Board of Health, Newark, N. J.:

GENTLEMEN—I herewith present my annual report for the year ending December 31st, 1897

As heretofore the principal chemical work has been the examination of milk and drinking water.

MILK

The inspection of this most important article of food has been carried out on the same lines as last year; samples being taken from dealers promiscuously, without any special reference to whether they were supposedly good or bad. In this way it is thought that a much better idea of the general quality of the milk supply may be obtained than by the taking of only such samples as are indicated to be below the standard by the lactometer test and the judgment of the inspector. The fallacy of the former is well known and the inspector is very often obliged to inspect the milk under conditions which make a proper judgment of its quality him either impossible

While it is true that such a system does not permit the collection of a fine in the case of an adulterated milk being found it indicates the places where it is liable to be met with, and if need be the inspector can then take a sample in the manner provided by law, where suit is to

be brought. Moreover the idea of milk inspection is not simply to collect fines, but to improve the quality of the article, and, I believe, an extension of the system and the taking of many more samples would be of great advantage.

CREAM.

Although cream is sold in considerable quantities in the city there are no regulations restricting its sale. Possibly for this reason no attention has been given to its examination, but the need of supervision of some kind is indicated by a number of analyses, made by the State Board of Health of Massachusetts in 1894, in which the amount of fat contained in the cream varied in different samples from 8 to 48 per cent.

PRESERVATIVES AND ARTIFICIAL COLORING.

The addition of preservatives to milk is a bad practice, is unnecessary and permits the sale of inferior and stale milk. Besides this the taking into the human system of such material may be considered an interference with the general health, and that whatever will arrest fermentative changes in the milk, will cause similar interference with the digestive ferments of the stomach. It is hoped to give more attention to this subject the coming year.

The artificial coloring of milk is probably not done to any great extent, although such practices doubtless exist in this city. The color may or may not be detrimental to health, but its use should be prohibited as the main reason for its use is to conceal the unpersishable condition

of a poor or adulterated milk, or to make an ordinary quality of milk look better than it really is.

FAT.

The percentage of fat in milk is more variable than that of any other constituent and ranges in pure milk anywhere from 3 to 6, with an average, perhaps, of $3\frac{1}{2}$. The fat for different reasons is the most valuable part of milk, and as there is no law fixing a minimum amount to be contained, there is great inducement for the adulteration of specially rich milk by partial skimming or the mixing of skim milk with whole milk. This can easily be done, and probably is, without making the milk fall below the legal standard of 12% of milk solids.

MILK ANALYSES

The total number of milk samples analyzed during the year was 136 and the percentages of total solids of each are given in tabular form, so that their variation in quantity may be seen at a glance. Of these 136 samples submitted for analysis, the result shows an average of 12.87 solids, or .87 above that required by the State standard, thus demonstrating that the general character of the milk sold is good.

CLASSIFIED TABLE OF MILK ANALYSES

Samples having a percentage of total solids above 12.50
Average 13.24

| | | | | |
|-------|-------|-------|-------|-------|
| 12.69 | 13.48 | 15.41 | 13.48 | 13.41 |
| 12.51 | 12.56 | 13.61 | 12.74 | 13.56 |
| 13.10 | 12.87 | 12.58 | 14.23 | 13.72 |
| 15.49 | 12.64 | 12.81 | 13.12 | 13.14 |
| 13.02 | 12.54 | 13.41 | 13.76 | 12.65 |
| 13.04 | 13.33 | 13.20 | 13.05 | 12.93 |
| 14.02 | 13.22 | 12.62 | 12.70 | 12.68 |
| 13.37 | 15.68 | 13.43 | 13.09 | 13.80 |
| 12.83 | 13.33 | 13.23 | 13.43 | 13.53 |
| 13.08 | 12.82 | 13.33 | 12.61 | 13.31 |
| 13.79 | 13.40 | 12.63 | 12.78 | 13.04 |
| 13.43 | 12.97 | 13.38 | 13.65 | 14.62 |
| 12.89 | 13.71 | 13.26 | 13.14 | 13.78 |
| 12.85 | 13.81 | 13.04 | 12.78 | 13.15 |
| 12.51 | 12.90 | 13.62 | 12.87 | 13.78 |
| 12.52 | 12.89 | 12.81 | 12.81 | 13.59 |
| 15.25 | 12.76 | 13.22 | 12.69 | 13.61 |
| 12.96 | 12.67 | 13.05 | 13.47 | 13.77 |
| 13.07 | 12.60 | 12.84 | 12.82 | |

Samples having a percentage of total solids between 12 and 12.50
Average 12.23

| | | | | |
|-------|-------|-------|-------|-------|
| 12.30 | 12.19 | 12.22 | 12.29 | 12.13 |
| 12.12 | 12.35 | 12.36 | 12.39 | 12.11 |
| 12.46 | 12.06 | 12.32 | 12.14 | 12.28 |
| 12.05 | 12.03 | 12.16 | 12.08 | 12.09 |
| 12.07 | 12.33 | 12.42 | 12.35 | 12.33 |
| 12.30 | 12.46 | 12.41 | 12.00 | |

Samples having a percentage of total solids below 12
Average 11.11

| | | | | |
|-------|-------|-------|-------|-------|
| 11.79 | 11.99 | 11.90 | 11.56 | 11.63 |
| 11.12 | 11.52 | 11.56 | 11.91 | 11.05 |
| 11.24 | 11.74 | 11.90 | | |

In the above table the samples have been arranged under three heads. Those with a percentage of total solids over 12.50, those between 12.50 and 12 and those below 12.

It is gratifying to observe that so large a portion, 19.12 per cent of the whole fall in the first class, and that they have the high average of 13.247 of total solids which is 1.24 above that required by the State Standard.

The second class formed 31.32% of the whole number and their average percentage of total solids is 12.23.

The third class may be considered as adulterated milks, they comprise 49.56% of the total number examined and have an average of 11.61% of solids.

WELL WATER.

The examination of well waters has not formed such a prominent feature of the analytical work as in former years, but enough has been done to show that the work is still very necessary. Thirty-one well waters were analyzed, thirteen marked "contaminated," fourteen "suspicious" and four "passable."

The importance of the subject is beyond question and it seems unnecessary to cite statistics and cases relative to well water and disease. That the abolition of well water for drinking purposes in cities has had and will have a marked effect on the death rate from certain diseases, is a fact accepted by all sanitarians.

THE ANALYSIS OF WATER.

As there seems to be a general misunderstanding regarding the relative value of a chemical or bacteriolo-

gical examination of water, it may be stated on impartial authority that no undue preference should be given either method in many cases. Each has its advantages in particular cases and under certain conditions. A well may be so situated that an effective filtration is established of the contaminating material, so that bacteriologically the water is passable, and possibly not dangerous to health at that time, whereas a chemical analysis might show the water to be badly polluted and its use unsafe from the possibility or probability of change in the conditions of the filtering process, whereby pathogenic germs may enter. On the other hand a water that could be passed as "chemically of good quality," might be shown to contain pathogenic bacteria by the Bacteriologist, and the fact be impossible of detection by chemical means. Under the present conditions of our knowledge of the subject, the only logical conclusion to be drawn is that both methods of examination should be employed wherever practicable.

Another point that cannot be too strongly urged is that all the information possible concerning the history of a water and its environment, shall be given to the Bacteriologist or the Chemist, with the sample, as it is often necessary for a proper interpretation of the results of the examination.

ANALYSES OF CITY WATER

The following table of analyses contains the results of the regular monthly examinations of water taken from the Laboratory faucet, at No. 215 Market Street :

ANALYSES OF NEWARK AQUEDUCT WATER

(PARTS PER 100,000)

| Date 1897 | Total Ammonia | Mineral Ammonia | Chlorine | Nitrogen as Nitrates | Nitrogen as Nitrates | Loss on Ignition | Fixed Mineral Matter | Total Solids | Color | Temp- erature F° |
|----------------|------------------|--------------------|----------|----------------------------|----------------------------|------------------------|----------------------------|-----------------|-------|------------------------|
| January 23 | .003 | .0117 | 13 | None | .01 | 1.15 | 2.35 | 4.2 | 24 | 38 |
| February 23 | .016 | .007 | 15 | " | .01 | 2.15 | 1.45 | 3.60 | | |
| March 23 | .022 | .0068 | 15 | | Trace | 1.70 | 1.45 | 3.25 | 34 | 46 |
| April 21 | .0022 | .0136 | .12 | " | .01 | 1.75 | 1.65 | 3.40 | .28 | 52 |
| May 21 | .0028 | .011 | .15 | " | .008 | 2.00 | 1.55 | 3.55 | .31 | 65 |
| June 21 | .0032 | .017 | .23 | " | .013 | 1.40 | 2.65 | 4.05 | .32 | 69 |
| July 21 | .0014 | .016 | .12 | " | .014 | 2.50 | 1.60 | 4.10 | .52 | 72 |
| August 21 | .0038 | .0194 | .11 | " | .0175 | 2.95 | 2.50 | 5.45 | .46 | 71 |
| September 21.. | .0014 | .014 | .12 | " | .02 | 2.00 | 3.25 | 5.25 | .54 | 65 |
| October 21 | .0018 | .019 | .12 | Trace | .01 | 2.70 | 2.75 | 5.45 | .45 | 59 |
| November 23.. | .002 | .0155 | .15 | " | .01 | 2.50 | 2.20 | 4.70 | .34 | 46 |
| December —... | .0014 | .0156 | .15 | " | .011 | 1.10 | 2.42 | 3.52 | .35 | 42½ |
| Average..... | .0022 | .0141 | .133 | None | .0112 | 1.990 | 2.13 | 4.12 | .39 | |

It will be noticed that the various determinations are very uniform from month to month, and that none of them differ materially from the average for the year. The total solids increase somewhat in the Summer and Fall months, probably owing to a greater concentration of the water at that time from lack of rain. The color, too, was worse during the same period.

COLOR.

The subject of color in water is of considerable importance, not so much, perhaps, from a sanitary as from the aesthetic view. The color of a water is a vital factor in the popular judgment of the character of a water supply, and doubtless the color in the City Water has much to do with whatever little complaint there is of its quality. This color is supposed to come from the peaty matter of the swamps in the watershed, but as far as I am aware nothing definite is known about it. A few experiments made by me at the watershed indicate that certain tributaries of the Pequannock river are colored much more strongly than others.

I would suggest that steps be taken to locate more exactly the source of the color to the end, that a partial remedy may be found.

TASTE AND ODOR

Together with the color the taste and odor of a potable water are probably the only characteristics that are considered by the general public in judging of its fitness for domestic purposes. The presence of a peculiar taste and odor in a water supply is often due to the growth of certain species of algae, a form of lower vegetable life,

or rather to chemical substances produced by them. A striking example of trouble from this source is furnished by the experience of the City of Brooklyn in 1896. The offensive properties of the water there was found to be due to the presence of a large number of the diatom *asterionella*.

The conditions affecting the growth of these algae cannot be discussed in this report, but their effect on surface water supplies is sometimes so serious that the constant microscopic examination of supplies of this character has come to be considered scarcely less important than the chemical and bacteriological analyses, and some of the leading cities now have daily microscopic examinations made of their water.

STANDARDS OF PURITY.

Inasmuch as the Pequannock river receives the discharge of several tributary streams before it enters the intake reservoir, it would be advisable to occasionally examine the water from these sources with the idea of establishing a kind of standard of purity for each with which future examinations might be compared. This could be advantageously done in connection with the search for sources of color, and would also furnish valuable aid in the interpretation of the data obtained in the examination of the general supply, either chemically or bacteriologically.

THE IMPORTANCE OF PURE WATER

This is universally admitted, but a forceful demonstration of peculiar interest to Newark will be found in

the following short table of Typhoid Fever statistics, which I have prepared for Newark and Jersey City.

DEATHS FROM TYPHOID FEVER IN NEWARK
AND JERSEY CITY; AND DEATH RATE
PER 10,000 INHABITANTS

| NEWARK. | | | JERSEY CITY | |
|---------|---------|-------|-------------|-------|
| YEAR. | DEATHS. | RATE. | DEATHS | RATE. |
| 1889 | 153 | 9.00 | 123 | ... |
| 1890 | 114 | 6.28 | 148 | 9.08 |
| 1891 | 186 | 9.64 | 158 | 9.45 |
| 1892 | 81 | 4.21 | 90 | 5.24 |
| 1893 | 44 | 2.22 | 105 | 5.98 |
| 1894 | 34 | 1.66 | 119 | 6.61 |
| 1895 | 50 | 2.31 | 134 | 7.36 |
| 1896 | 47 | 2.09 | 114 | 6.09 |
| 1897 | 33 | 1.44 | 41 | 2.14 |

The above table of statistics is specially striking evidence of the influence of good or bad water on the Typhoid Fever death rate. Both cities took their supply from the polluted Passaic river until April, 1892, when Newark obtained its new supply from the Passanook river.

Notwithstanding the reduction in the rate in Newark, Jersey City still had the usual number of deaths from the disease annually. Even though, from January, 1900, a very large part of the water used came from the Passanook there was enough of Passaic water mixed with it to keep up the high rate until 1897, when the water from the latter source was abandoned.

MISCELLANEOUS ANALYSES.

Under this head are included the few examinations made apart from those of the water and milk already referred to. They consist of a sample of ice which was found suspicious, a sample of chloride of lime which was of full strength, some that examined for mineral poisons and none found, and several special analyses of City Water upon which separate reports have been submitted.

CONCLUSION.

In conclusion I would like to call attention to the seeming necessity for the examination of drugs.

The Massachusetts State Board of Health has paid considerable attention to the subject for several years, and of several thousand samples analyzed from 1892 to 1896, found from 30 to 60 per cent. adulterated: the greater number during the latter years. Of course, it is understood that these samples were taken as "suspicious," and the large percentage of adulteration does not apply to the general drug market, however, I know of no reason why Newark should have a better quality of drugs than the cities of Massachusetts.

HERBERT B. BALDWIN, Chemist

[TABLE No I.]
BIRTHS REPORTED DURING YEAR 1897

| COLOR. | | NATIVITY OF PARENTS. | | | | | | | | | | NAME OF CHILD | | LEGITIMACY | | | | |
|--------|---------|----------------------|--------|-------------|--------|----------|---------------------|----------------------|------------------------------|------------------------------|------------|---------------|------------|------------|---------------|--------|----|------|
| White | Colored | Male. | Female | Not Stated. | Native | Foreign. | Foreign Father only | Foreign Mother only. | Native of Father only Stated | Native of Mother only Stated | Not Stated | Stated | Not Stated | Legitimate | Illegitimate. | Total. | | |
| 330 | 90 | 275 | 266.4 | 1 | 2132 | 2351 | 51 | 24 | 8 | 5 | 37 | 20 | 21 | 3975 | 1445 | 536 | 59 | 5420 |

ON

STILLBIRTHS REPORTED.

| SEX. | | | FATHER | | | MOTHER | | | COLOR | | Total |
|-------|---------|------------|--------|---------|------------|---------|----------|------------|--------|---------|-------|
| Male. | Female. | Not Stated | Native | Foreign | Not Stated | Native. | Foreign. | Not Stated | White. | Colored | Total |
| 17 | 14 | 1 | 3 | 8 | 2 | 11 | 14 | 1 | 1 | 1 | 2 |

[TABLE No. II.]
MARRIAGES REPORTED

| MARRIAGES | | | | | | | | | | | | | | | | | | | | Total |
|-----------|--------|---------|--------|----------|--------|------|--------|------------|--------|----------------|--------|-----------------|--------|----------------|--------|-----------------|--------|------------|--------|-------|
| White | | Colored | | NATIVITY | | | | Not Stated | | First Marriage | | Second Marriage | | Third Marriage | | Fourth Marriage | | Not Stated | | |
| Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | |
| 21 | 21 | 52 | 51 | 135 | 135 | 902 | 944 | 2 | 20 | 1736 | 185 | 221 | 208 | 1 | 12 | 1 | 0 | 252 | 229 | 2224 |

[TABLE NO III.]

NATIVITY OF DECEDENTS

| | |
|---------------|------|
| United States | 2725 |
| Ireland . | 440 |
| Germany . | 512 |
| England | 93 |
| Italy | 13 |
| Russia | 39 |
| Scotland | 27 |
| Austria | 21 |
| Hungary. | 18 |
| Switzerland | 16 |
| France. | 9 |
| Poland | 6 |
| Denmark., . | 6 |
| Belgium | 3 |
| Norway. | 2 |
| Holland | 2 |
| China | 2 |
| Canada | 1 |
| Sweden | 1 |
| India | 1 |
| Romania | 1 |
| Not Stated | 35 |
| <hr/> | |
| Total | 4023 |
| Native Born | 2725 |
| Foreign Born | 1263 |
| Not Stated | 35 |

[TABLES NOS. V. AND VI.]
WELLS RECORDED.

PRIVY VAULT AND
CESSPOOLS WITHIN.

| Location of Well. | Sample No. | Kind and Depth. | For Manure or Domestic Purposes. | | | | Result of Analysis. |
|-------------------------------|------------|-----------------|----------------------------------|---------|---------|---------|--------------------------|
| | | | Feet | Feet | Feet | Feet | |
| Went Ave. | 657 | Bucket 20' | Domestic | | 1 P. V. | | Contaminated. |
| Academy St. 126. | 654 | Bucket 24' | " | | 2 P. V. | | Very suspicious. |
| Bellevue Ave. 116 | 655 | Bucket 35' | | 3 P. V. | | | Badly contaminated. |
| Baldwin St. 20. | 251 R | Pump .. | " | .. | .. | .. | Very suspicious. 7 |
| Barclay St. 198-200. | 656 | Pump .. | " | .. | .. | | Suspicious. |
| Crane St. 11. | 653 | Pump 35' | " | 1 C. P. | | 2 P. V. | |
| Congress St. 12. | 270 R | Pump | | 1 P. V. | 1 P. V. | | Very badly contaminated. |
| Calumet St. 18. | 655 | Pump 20' | " | .. | 1 P. V. | .. | Contaminated. |
| Calumet St. 28. | 657 | Pump | | | 1 P. V. | | Very badly contaminated. |
| Camden St. 46. | 668 | Bucket 40' | " | .. | .. | .. | Contaminated. |
| Elm Road | 670 | Bucket 11' | " | | 1 P. V. | | Very suspicious. |
| Elm Road (Pennington Park) | 673 | Pump 15' | | 1 C. P. | 1 P. V. | | Very badly contaminated. |

| | | | | | | |
|---|-------|--------------|----------|----------------|----------------|--------------------------|
| Ferry St 227. | 271 R | | Domestic | | 1 P V | Very suspicious. |
| Gillette Pl. 28. | 669 | Pump 30 | " | | 2 P V | Suspicious |
| Hunterdon St 626 | 660 | Pump 15' | | | 2 P V | Suspicious. |
| Halsey St. 76 | 658 | Pump 25 | " | | | Passable |
| Hawthorne Ave and } South Tenth St } | 662 | Bucket 12 | | | 1 P V | Suspicious. |
| Jay St 25. | 671 | | | | | Very suspicious |
| Komorn St. 15. | 659 | Pump | " | 1 C P 1 P V | | Contaminated |
| Lincoln Ave 47. | 664 | Pump | " | | 1 C P 1 P V | Contaminated |
| Main St. 37. | 666 | Bucket | | | 1 P V | Very badly contaminated. |
| Magazine St. 134-136 ... | 629 R | Bucket | " | | 5 P V | Badly contaminated |
| Magnolia St 34. | 661 | Bucket 36' | " | | 1 P. V. | Suspicious. |
| M. & E R R. Ave. 135 | 674 | Artesian 100 | " | | 1 P V | Contaminated |
| Prospect St 72. | 663 | Pump | " | | | Passable |
| South St 99. | 652 | Pump 17' | " | 1 P V | | Very suspicious |

Letter "R" indicates where wells were re-analyzed.

METEOROLOGICAL REPORT.

Summary of the weather for the twelve months ending December 31, 1897 as compared with previous years, as far back as 1843, when the first records were kept.

Unusual rain fall one of the features of the twelve months, it having been eighteen inches more than the average. October a remarkable month, when the temperature ran high. A large number of days on which there was sunshine.

During the year the temperature was a trifle above the average, as will be seen by the following table :

| | Mean Temp. since 1843. | Means for last six years. | Means for 1897. |
|----------------------|------------------------|---------------------------|-----------------|
| January.. | 29.1 deg. | 29.3 deg. | 29.9 deg. |
| February.. | 30.4 | 30.1 | 33.6 |
| March.. | 37.7 | 39.4 | 41.3 |
| April.. | 48.7 | 50.0 | 50.4 |
| May.. | 58.2 | 62.0 | 61.7 |
| June.. | 68.7 | 71.8 | 68.1 |
| July.. | 74.2 | 74.8 | 75.3 |
| August.. | 71.5 | 73.6 | 73.0 |
| September | 64.5 | 66.4 | 65.9 |
| October | 53.4 | 54.3 | 56.3 |
| November | 42.8 | 44.7 | 44.6 |
| December..... | 32.8 | 34.6 | 35.7 |
| Average..... | 51.9 | 52.5 | 53.0 |

I began keeping the records in 1892. The highest temperature ever recorded in Newark was 100.5 degrees in September, 1870, and the lowest 12.7 degrees below

zero in 1866. Only one maximum temperature record was broken in 1897. This was the October record. On October 1 the thermometer registered 80 degrees, and on the sixteenth the mark was 89 degrees. The highest previous October record was 83 degrees in 1879. The highest and lowest temperature for each month this year follows:

| | HIGHEST | LOWEST |
|---------------|---------|--------|
| January... | 51 | 5 |
| February | 54 | 11 |
| March | 66 | 16 |
| April | 82 | 25 |
| May | 84 | 44 |
| June | 91 | 46 |
| July | 96 | 60 |
| August | 88 | 55 |
| September | 95 | 42 |
| October | 89 | 37 |
| November... | 68 | 21 |
| December..... | 62 | 10 |

The 88 degrees in August marks the lowest maximum temperature for August since the local bureau was started. In 1899 the lowest temperature was 5 degrees below zero, and the highest 97 degrees, which was recorded on August 6, 7 and 11.

The precipitation of rain and snow for this year has been greatly above the average. Since 1843, the number of days on which rain or snow fell averaged one in three. This year the number of days on which there was precipitation in measurable quantities was 134. The unusually wet months were May, July, August, November and December, and the dry months February, September and October. The normal this year by months was as follows:

| | | | |
|----------------|-------------|----------------|---------------|
| January..... | 3.19 inches | July..... | 19.09 inches. |
| February | 2.95 " | August..... | 8.69 " |
| March..... | 2.84 " | September..... | 2.29 " |
| April..... | 3.69 " | October..... | 1.65 " |
| May..... | 6.56 " | November..... | 4.99 " |
| June..... | 3.92 " | December | 4.54 " |

This makes a total of 64.31 inches. The average annual rainfall has been 40.25 inches, or about four inches a month. This year the average was beaten by nearly eighteen inches. The July rainfall of nearly twenty inches was the heaviest ever recorded. On July 28 eight inches fell, or about two months' rain in one day.

Dry and wet seasons occur in cycles of five years. The five years previous to 1897 were dry, and I am of the opinion that the next four years will be wet, probably as wet as this year.

During the year the snowfall was thirty nine inches on the level. In January 12 inches fell, in February 8.25, in March 2.25, in November 2.50, and in December 5 inches. The highest humidity was seventy-three per cent., the normal being sixty-five.

The weather last autumn was delightful, August, September and October averaging more than the usual number of fair days. There were thirteen cloudless days in August, seventeen in September and fourteen in October. During the year the sunshine recorded sixty-two per cent. of the time the sun was scheduled to shine.

The greatest velocity attained by the wind was sixty miles an hour, in March, while in April and November fifty miles were recorded. The wind blew more frequently from the west southwest than from any other point of the compass.

The mercury in the barometer in the course of the twelve months ranged from a minimum of 29.211 inches to a maximum of 30.835 inches.

I have no record of any phenomena of unusual significance during the year. There were the customary fogs in January and a beautiful parhelion was seen on January 11. February was a disagreeable month. Lincoln Day and Washington's Birthday were cloudy and stormy. On the former five and one quarter inches of snow fell and it rained during the evening of the latter. Inauguration Day, March 4, was fair, though it snowed the next day. The last snowfall of the season was on March 14, though there was a slight flurry on April 12. St. Patrick's Day was clear and Easter Sunday, April 18, was an ideal day. There was a severe frost as late as April 21 and ice one and one-half inches thick formed on small ponds on April 20.

May was marked by a number of severe thunderstorms, there having been no less than nine of them. On May 10 one man was killed by lightning and many buildings were struck.

July, as has already been noted, was memorable on account of the unprecedented rainfall. Rain fell on seventeen days, but Independence Day was clear and fair.

There were no particular cool days in August, though the month was marked by heavy rainfalls. It was the wettest August for fifty years. The rainfall was 8.69 inches, while the previous average had been 5.07 inches.

Labor Day, September 1, was clear and not too warm. The public schools opened on September 13, and for the first time in many years the pupils were not troubled with

warm weather, and the teachers were not forced to close the schools

A few flakes of snow were seen in the air as early as September 23, and the first frost of the season occurred September 28.

October opened up with a record breaker. On October 1 the mercury registered 86 degrees, on October 15, 83, and on October 16, 89. I think that this October record will stand for a century.

The first killing frost was on October 31 and the first snowstorm on November 23, when 2.25 inches fell. Ice formed on the pools as early as November 18, and there was some skating on the meadows November 24 and 25.

During December there were three snow storms. The New Year was ushered in with clear, cold weather.

GEO. C. SONN,

Voluntary Observer U. S. Weather Bureau.

AREA OF CITY AND EXTENT OF PUBLIC IMPROVEMENTS

| | |
|---|------------|
| Census population, 1890... | 181,830 |
| Estimated " 1897. | 230,000 |
| Total area of the City's square miles. | 18½ |
| Built up portion, square miles | 12½ |
| Meadow land " " | 6 |
| Length of River and Bay front, miles | 10 5 |
| Number of miles of granite block. | 28.52 |
| " " " trap | 12.34 |
| " " " telford pavement. | 11 28 |
| " " " cobble stone pavement. | 14 98 |
| " " " asphalt pavement | 20.08 |
| " " " brick pavement. | 2.19 |
| Total length of paved streets | 90 39 |
| Number of miles of unpaved streets | 125.56 |
| Length of Electric Railways, miles. | 70.00 |
| Length of Steam Railways. | 28 38 |
| Length of brick sewers. | 56 42 |
| Length of pipe sewers | 83 09 |
| Total length of sewers | 139 51 |
| Total number of sewer basins. | 2403 |
| Length of water mains, miles. | 229¼ |
| Average daily consumption of water during the month gallons. | 25,000,000 |
| Capacity of water supply per day, gallons | 50,000,000 |
| Number of buildings | 29,736 |

PUBLIC PARKS

| | |
|-------------------|------|
| Military, acres | 6 45 |
| Washington, acres | 3.40 |
| Lincoln, " " | 4.37 |

NEW PARKS

| | |
|---------------------|-----|
| Branch Brook, acres | 280 |
| East side " | 13. |
| West side " | 23 |

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